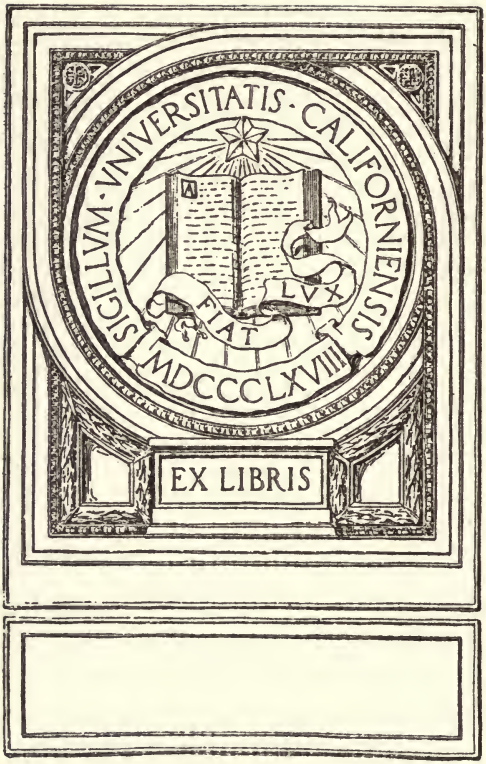
THE LOCOMOBILE BOOK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THE CAR OF 1911
THE LOCOMOBILE

Round the World in a Locomobile. Crossing Hamana Bay, Japan, in a ferry consisting of two sail boats lashed together

THE CAR OF 1911

BEING THE LATEST EDITION OF THE LOCOMOBILE BOOK, WHICH ILLUSTRATES AND DESCRIBES 1911 LOCOMOBILE MODELS AND SETS FORTH BY WORD AND PICTURE THE MANY AND VARIED ADVANTAGES OF THE LOCOMOBILE CAR

Univ. of California

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PREFACE

Although presented in book form for convenient reading, this publication is essentially a catalogue of motor cars. It is arranged by chapters, indexed and illustrated.

There are two Locomobile models.

The "30" Type "L", $3500. Four Cylinders, Four Speeds. Described in Chapter Two.

The "48" Type "M", $4800. Six Cylinders, Four Speeds. Described in Chapter Three.

Both models are equipped with Shaft-Drive, High-Tension Dual Ignition and the latest types of four-door bodies—they are the result of twelve years' experience in manufacturing automobiles.

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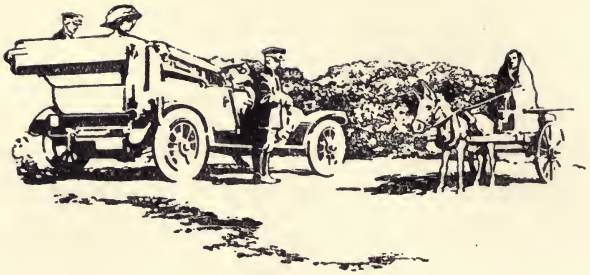

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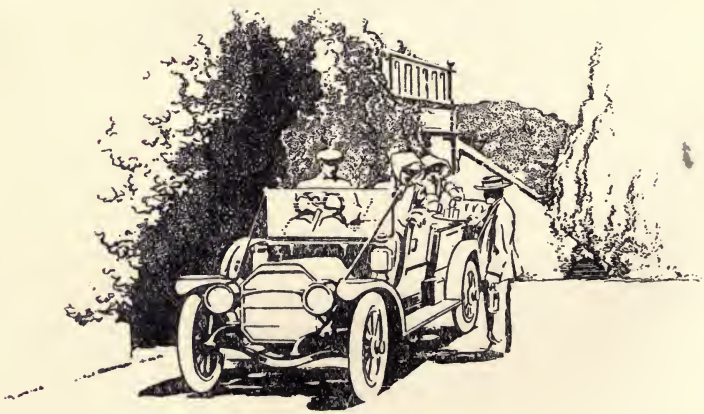
CHAPTER ONE



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CHAPTER ONE

It is appreciated today more widely than ever that the modern motor car is essentially a machine. There is no longer any mystery about the automobile, and although the pleasure derived from its use casts a charm over it and makes it seem different from other machinery, it nevertheless exists as a twentieth century utility along with the electric locomotive and turbine steamboat. Like these, it is more than an ordinary machine—it is a combination of machines, constantly subjected to the shocks induced by travel, and must therefore be particularly well built in order to prove safe and satisfactory from year to year.

Every company engaged in manufacturing, milling, printing, or in any business requiring the use of machinery, realizes the necessity of purchasing the best obtainable, because it is the cheapest in the end. In fact, most machinery is of the most durable sort possible to build. The railroad does not attempt to secure low-priced engines; on the contrary, purchases the finest product available in order that trains may be hauled quickly, safely, and at a low maintenance cost. All machine tools, printing presses, and similar machines are invariably of the highest type, because

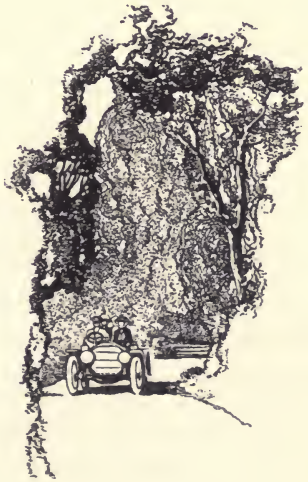
the companies who operate them cannot afford to purchase anything else.

The automobile is probably the most highly specialized of all modern machines. If this were not so we should have had automobiles seventy-five years ago, as we did locomotives. Consequently, if it pays the manufacturer to buy the best machinery he can get, it pays the purchaser of the automobile even better to select the safest and most durable car on the market. During the past few years the automobile industry has witnessed the introduction of a large number of new makes, mostly low in price. These cars have been bought by thousands of people in all sections of the country. Many automobilists, however, who have purchased low-priced cars are now ordering the best automobiles that are produced, and many other automobilists are buying second-hand cars of high reputation in preference to further investment in cheap new cars.

The Locomobile for 1911 is offered as the safest and most durable machine that our twelve years' experience in building cars has enabled us to produce. It is a car of the soundest engineering principles, built throughout in the Locomobile factory of the finest material, put together with the greatest care, and thoroughly tested in every particular. The Locomobile is so strong and so safe that it is sure to prove the

most reliable car and the cheapest in the end. It represents the utmost possible combination of strength and refinement, resulting in a safe vehicle with unlimited comfort and endurance. The possession of such a car, together with the benefits to be derived from doing business with a long experienced and well established organization, insures lasting satisfaction —the best there is in automobiling.

We offer for 1911 two models of proven excellence, together with the fullest measure of co-operation with owners.



REASONS FOR SELECTING THE LOCOMOBILE

High Factor of Safety. Undoubtedly the most important reason for selecting the Locomobile is its safe construction. The greatest charm of automobiling is found in the visits to remote places where the roads are rough and the conditions severe; the Locomobile owner drives his car everywhere he wishes, with a feeling of absolute safety at all times, and his confidence in the car grows stronger every year he drives it.

It is not difficult to make a car that will stand the tests of mild motoring for a time, but it takes experience and skill to make a car that is so safe that it never fails when the unexpected emergency happens. Locomobile owners trust the Locomobile car because of the high factor of safety in design, the surplus strength that prevents breakage, and consequent accident. An example of this care is shown in the wheels, which are made of the toughest second growth hickory, and so firmly fastened to the axles that they cannot come off. The spokes are very heavy and there are twelve of them in the front wheels, two more than in ordinary cars. Locomobile brakes are powerful, substantially built and operated by strong, safe mechanism; Locomobile axles are designed and built in our works and are the strongest

possible to build; the Locomobile is the only shaft-driven car that uses alloy steel in the rear axle tubes; the quality of steel in the front axle is so tough that it can be bent double *cold* without seam or check. The safety of the Locomobile steering apparatus is a matter on which we wish to lay great stress, as the character of the control mechanism of a car is of the utmost importance to the owner. All parts of the Locomobile steering gear are exceedingly large and strong, are carefully made of the very best material obtainable, and are secured in the most substantial manner possible. The result of all these precautions, year after year, has given the Locomobile the highest reputation for safety. *It is a permanently safe car* under all conditions of road travel.

Attractive Features in Design. Our first gasolene machine was the first American car with a four-cylinder vertical water-cooled motor, steel frame, and sliding-gear transmission. The Locomobile design today is in the hands of the same men who produced the first gasolene Locomobile; consequently our car has enjoyed a satisfactory and rational development from a sound basic design, scientifically correct in every detail. The 1911 Locomobile is fully abreast of the times; is designed in accordance with the latest approved ideas, yet contains no feature that has not been demonstrated to be permanently valuable.

The following features indicate the desirability of the Locomobile from an engineering standpoint:

1. *High-tension dual ignition.* The best imported apparatus.

2. *Bronze motor base.* This is an important exclusive feature of the Locomobile, giving maximum life to the motor. Made in one piece for simplicity.

3. *"T" head motor.* Admission and exhaust valves located on opposite sides. This is the best type of motor for reliability.

4. *Moderate length of motor stroke.* This insures the longest life to the bevel-driving gears, power being obtained by increased shaft speed instead of by high torque.

5. *Adequate cooling system.* This is obtained by the use of large areas. Exceedingly efficient and reliable.

6. *Metal timing gears instead of fibre.*

7. *Low center of gravity combined with ample clearance for American roads—insuring safety.*

8. *Special arrangement of motor valve lifters.* This produces quietness, and obviates the use of fibre discs, which quickly wear and need renewing.

9. *Automatic carbureter.* This is our own design and the result of years of experience. Durable bronze construction. Perfectly automatic in action.

10. *Wide use of anti-friction bearings.* Imported annular bearings are used practically throughout the car.

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The "30" Locomobile Touring Car, Type "L", Four-Cylinder, Shaft-Drive

11. *Perfect balance.* By this is meant the uniform strength of the parts, the harmonious adjustment of the various components and the careful distribution of weight. These result in a car that is a mechanical unit—very durable, steady riding, and easy on tires.

12. *Four-speed selective transmission.* This enables the car to be operated to the best advantage and makes gear shifting easy and certain.

13. *Manganese bronze transmission case.* The great strength of manganese bronze insures perfect alignment of the gears and bearings, and consequent long life to the mechanism.

14. *Liberal differential gear design.* The Locomobile differential gear is notable for the ample size of the gears and other parts in proportion to the size of the motor, everything being made of the best possible material. As a result there is no replacing of parts, no binding or cramping under any conditions—no trouble whatever.

15. *Exceedingly high factor of safety.* This insures ample strength of the steering mechanism, wheels, axles, and brakes and other parts which are of great importance as regards safety.

16. *Attractive propeller shaft details.* The Locomobile driving shaft is alloy steel and provided with a universal joint at each end. The forward joint is of the yoke variety and the construction is such that the

shaft is locked in place under all conditions—an important advantage.

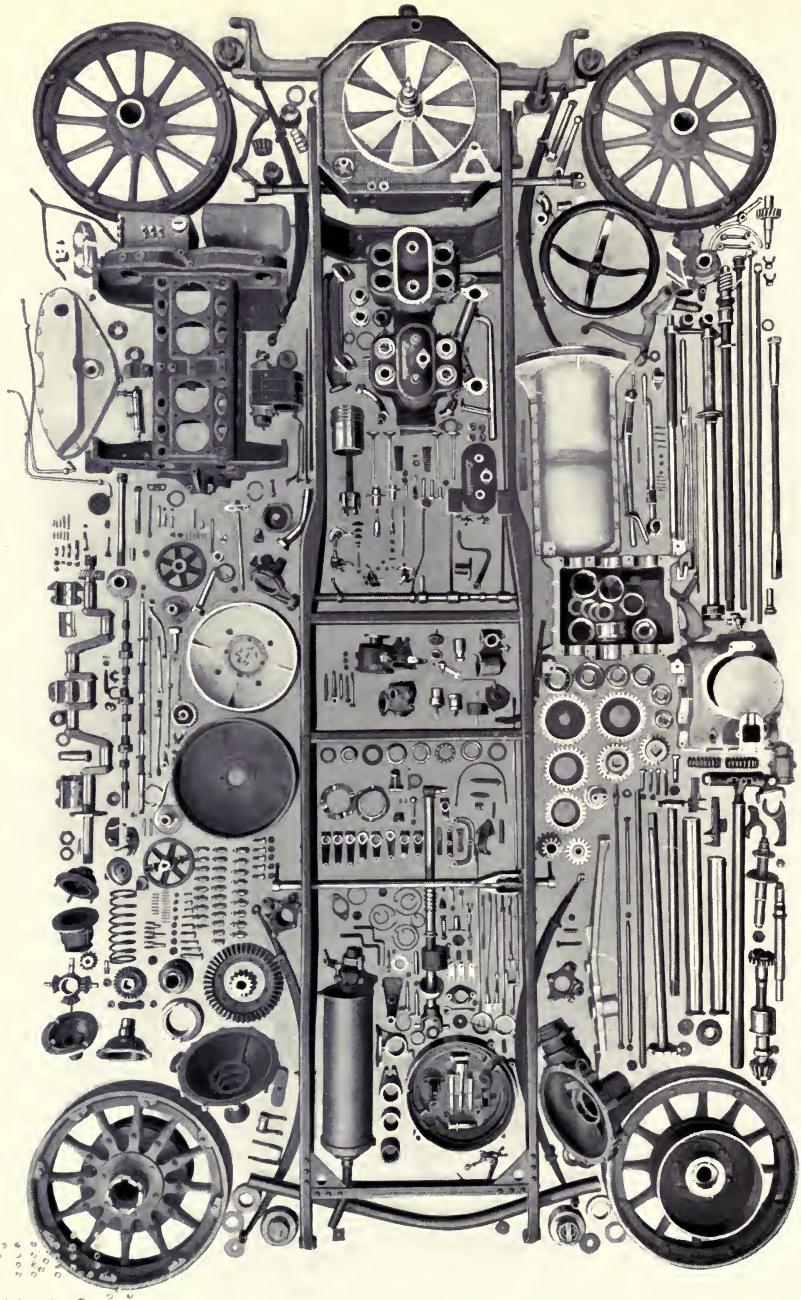
17. *Rear axle acts as a beam only.* In most cars there is great torsional stress on the rear axle. In the Locomobile the spring chairs have a lubricated bearing on the rear axle and similarly with the rear ends of the distance rods to which the brakes are attached. As a result, all action of the brakes and springs, and all driving and other stresses, are properly transmitted without any twisting action on the rear axle.

18. *No brazing in rear axle construction.* A very strong advantage of the Locomobile. It is interesting to note that the strength of a brazed joint is uncertain, and for this reason the number of brazed joints in the Locomobile is reduced absolutely to a minimum.

19. *Thorough lubrication system.* At thirty places on the chassis where oiling is necessary, dirty oil holes are eliminated and clean and easily operated grease cups are substituted.

20. *Large tire sizes.* The Locomobile has always been provided with tires a little larger than necessary and this advantage is, of course, assured in the 1911 models, which are also provided with demountable rims.

The Locomobile is Built in the Locomobile Factory. All motor cars are of two classes—built cars and assembled cars. Most automobiles are of the second variety,



The parts of the " 30 " Locomobile

The number of parts and pieces in the modern automobile is very great, nearly six thousand in all. This is because the motor car is a complicated structure, in reality a combination of machines. The illustration on the opposite page shows practically all the parts entering into the construction of the "30" Locomobile chassis. Any car, whether four or six-cylinder, whether low in price or not, contains about the same number of parts. In the high grade automobile, like the Locomobile, each one of these parts is made from carefully selected material, machined and finished with greatest care, and the closest attention is paid to the important inspection and testing processes so necessary to safety and durability.

assembled by the company from ready-made parts purchased from the part-maker's stock. The other variety comprises those cars that are largely built in the company's factory and which contain a motor, transmission, and chassis, aggregating thousands of separate pieces, all of which the maker has designed and made on his various machines. It should be evident that this is the only way in which the ideal automobile can be produced, for the reason that the design and construction of the car must be carried on under the same roof, as both are of equal importance. Any car may have attractive features that sound well, yet the car may fail if hastily designed or improperly built. And between the assembling firm and the parts maker there can only be an approximately close connection. A car built from start to finish by one organization may cost more to build than one composed of parts which are produced by the thousand for the trade, but it is better unified, better in every respect at the outset, and will certainly outlast several cars of the assembled variety.

High Character of Materials. From the time, years ago, when the first Locomobile touring car appeared on the market, it has been distinguished by the uniformity and superiority of its metals. Special formula bronze is employed in three parts of the car; the crank case of the motor, the transmission case, and the housing

containing the steering gears. The use of bronze at these points increases the cost of the car over and above what aluminum would cost, but as no casting material has ever been found which has the strength of bronze and which can be so successfully cast in intricate shape and light section, this material has been deliberately chosen in order to insure the safety and maximum life of the machine. Aluminum is only used on the Locomobile where it can be employed safely and where weight can be reduced as a consequence.

The steels used in the construction of the Locomobile are the most expensive obtainable and are the most suitable in every case for the purpose intended. Steel selected for a particular part is subjected to heat treatment, in a splendidly equipped factory department, so as to bring it to the exact degree of hardness or toughness which may be most desirable under the circumstances. As to quality, it may be stated for example, the spring steel for automobile springs may be purchased as low as eight cents a pound; Locomobile spring steel costs twenty-eight cents a pound and is the best and toughest that can be obtained.

The matter does not end, however, with the selection of stock, as rigid care and exceptional facilities must be applied to the handling of modern alloy steels which are complicated in structure and which may be spoiled in the working if treated

unskillfully or with insufficient apparatus. For six or seven years we have maintained one of the most up-to-date heat-treating and annealing establishments in New England, and every piece of steel used in the Locomobile is subjected to heat treatment right in the Locomobile shops; thus Locomobile metal is not only the best obtainable but it is intelligently and correctly handled, so as to get the best results from the raw material.

The third important point refers to the physical and chemical tests of the materials used. Every lot of material entering into the construction of the car is subjected to a complete chemical analysis and thorough physical test in order that the high quality of Locomobile material may be maintained permanently.

High Order of Workmanship. Our car has always been known as a very carefully built and substantial automobile. One of our recent customers told us that a short time ago he was visiting one of the largest, if not the largest, French automobile factories, in company with a friend, and saw there several American cars representing the best makes of this country. On inquiry it was found that the maker was designing part of his product especially for American travel and was examining the best American cars to get "pointers". When discussing the various makes, this French builder stated that the Locomobile was the

best built machine in the lot. Such incidents have led us to believe that the phrase "The Best Built Car in America" is amply justified.

Every automobile, whether it is a small or a large car, is composed of thousands of separate pieces, and the number of nuts and bolts holding these pieces together is necessarily enormous. In the Locomobile every nut and the end of every bolt is hardened. Double lock nuts and cotter pins are used throughout so as to secure each part permanently. The Locomobile is composed largely of forgings, which are produced complete in the Locomobile works; even the dies from which the forgings are made, are sunk by experts in our employ. Every forging and, in fact, every casting is subjected to the acid test, to the action of the sand blast, and in addition to this, *every forging is heat-treated.* All gear wheels are produced in the Locomobile works from start to finish. In every department the highest character of machine practice is followed, with the result that the car is a homogeneous unit composed of perfectly built components.

Thorough System of Testing. All Locomobile parts are made in the Locomobile factory and subjected to a critical inspection—every forging, every nut, bolt and screw, every part, large or small, is carefully examined before it is used. Some parts, like the crank shaft, are inspected after each operation. The principal

components of the car — carbureter, magneto, motor, transmission, steering column, rear axle, etc.—are tested separately; consequently, when the car is completed it is composed of tested units. Each car is given a severe road test during which it is tuned up and adjusted until it fulfills a long list of strict requirements. After the car is painted and equipped and ready for delivery, it is given a final inspection and road test to make sure that everything is in perfect order for the customer.

All these testing processes are exceedingly expensive and are consequently not applied to the cheaper makes of cars, but it is not possible to produce a truly high class car, a safe, substantial machine like the Locomobile, unless every precaution is taken at each stage of manufacture.

From the moment when the first operation is started on the first part of the Locomobile, until the completed car is ready for delivery, the manifold processes are watched and checked. The result is a perfect machine, or as nearly perfect as it is possible to make.

The Locomobile is Permanently Powerful. Purchasers frequently infer that because a car may make a satisfactory demonstration, that it will do so every day. They are also led to believe that the mere dimensions of a motor must necessarily mean satisfactory power for hill climbing and general service, whereas it is only

in the high class car that the power of the motor is high for its dimensions, and it is only in a car of the highest type, such as the Locomobile, that the power of the motor remains constant and does not diminish after the car has been run a few months. The Locomobile is widely known as a machine that will accomplish the work every day that it is required to do, and that will perform with the same satisfaction at the end of a year's hard service as it did at the outset.

The power of a motor car and its generally satisfactory performance result as much from proper co-ordination of the parts as anything else. A large motor may not develop the power it should, or it may suffer loss in road performance through a poor transmission design which absorbs power and cuts down speed, or else the chassis may lack balance, in which case the faulty distribution of weight makes the car skid before the full power of the motor can be utilized. Further than this, the riding qualities of the car may be such that the full power of the motor cannot be utilized for speed and hill climbing with either safety or comfort. The "30" Locomobile, for example, with its four-cylinder motor of 4½-inch bore, will not merely operate *consistently*, but will give better road performance than many cars with larger engines, and with greater economy and greater comfort.

Comfort. The automobile, by reason of its convenience and adaptability, is more popular than any other means of transportation, and many of our owners use their cars whenever possible in preference to traveling by rail. In these days of long motor trips the matter of comfort is becoming increasingly important, and the only way to enjoy luxury of travel is to possess a car that is reliable, absolutely safe, and that rides very easily and steadily. If the car is deficient in any of these particulars, there is bound to be mental or physical discomfort, or both, which may be very unpleasant on a long trip.

One reason why the Locomobile rides so well is that it has a sufficient amount of weight, yet not so much as to be hard on tires. The heavy Pullman rides easier than the day coach, and the heaviest and largest ocean liners are the most comfortable vessels possible. True comfort cannot be realized by riding in a light car.

Another feature of the Locomobile is the proper *distribution* of weight, which produces steadiness and eliminates any tendency towards skidding or side sway when traveling at speed. The spring suspension, design of body, the shape of the cushions and their deep luxurious springs, and all of the matters which have to do with comfort, have been worked out in the Locomobile to the fullest particular. It is a *permanently comfortable* car under all conditions of road travel.

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The "48" Locomobile Touring Car, Type "M", Six-Cylinder, Shaft-Drive

Quietness. Silence of operation is a feature of the automobile that is increasingly important. For many years the Locomobile was a chain-driven car entirely, on account of the greater reliability at that time of this particular system of final drive. Years of careful experiment enabled us to produce a shaft-driven car possessing the same reliability as our chain-driven product, with the result that all Locomobiles for 1911 are provided with shaft-drive. They are quiet cars and will continue so. The matter of permanent quietness is of great importance and the average purchaser believes that if a car is quiet at the outset, it is destined to remain so, whereas most cars have fibre gears that are not so durable as metal gears and which consequently wear and become noisy. The Locomobile is provided with metal gears precisely machined.

Exceptional care is employed in the construction of the valve system in order to insure quietness at this point. A special arrangement of the valve lifters makes them very quiet, and without using fibre discs, which need frequent renewing.

A very thorough system of lubrication enables the operator of the Locomobile to keep all wearing parts adequately lubricated by means of grease cups, in a very convenient manner, with the result that squeaking and rattling may be entirely avoided with moderate care in maintenance. The Locomobiles for 1911 are the

quietest models we have ever produced and our effort has been to make them as permanently quiet as possible.

Economy of the Locomobile. True automobile economy means more than a saving in oil and gasolene over some other car, and to this the experienced automobilist will readily attest.

Our claims for economy are based particularly on the fundamental merits of the Locomobile; it is an economical car to maintain because the parts do not break or wear out. Economy in tire replacement is effected by equipping our cars with tires which are large enough to do the work every day without being overloaded and are larger than required by the tire makers to carry our load. Tires frequently wear out before their time because the rubber is subjected to too much pressure; also because of defective steering wheel design the front wheels do not run true and the tires are ground down; also because of poor balance or faulty differential design there is too much skidding at the rear and consequent wearing down of the tires of the driving wheels.

The Locomobile is economical in oil and gasolene on account of its correct construction, which reduces friction and saves power.

We claim economy of time in maintaining the Locomobile because of the small need for adjustment and tinkering. If a few simple rules are followed, the

Locomobile can be driven for thousands of miles without other attention than to fill the tanks and to keep the wearing parts properly lubricated, arrangements being such that this is easily and conveniently accomplished.

The greatest bugbear in the mind of the automobilist is depreciation, and this is something that is inseparable from economy. Rapid depreciation of paint, upholstery, and tires calls for needless outlay; rapid wearing of parts means inevitable expense in replacing such parts long before it is necessary. In the things that count the most, in the details that produce longest life and least wear, the Locomobile is the supreme American machine.

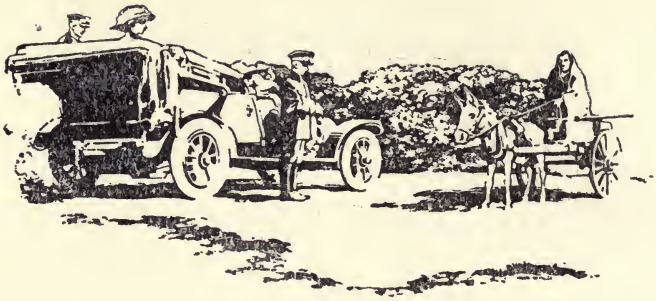
Record of the Locomobile. In the early days our car was conspicuous for its performance in racing and endurance contests, but we soon found that the expense and time incidental to such competitions was out of all proportion to the benefits received. In recent years we have directed our entire energy to the betterment of our product and to the perfecting of our organization, and to giving the best possible service to customers. We believe that the performances of the Locomobile in public competitions have been so striking as to leave no doubt in the minds of the public as to the excellence of our product. It will be recalled that the Locomobile was the first American car to win

the International Race for the Vanderbilt Cup, and during this race the Locomobile made the fastest time accomplished in this contest for six years. Our pride, however, lies chiefly in the record of the Locomobile in the hands of our owners. One of our cars has made a trip around the world at a cost for repairs and replacements of less than the cost of an inner tube, without disturbing the motor, transmission, frame, brakes, cooling system or other parts of the car. Such a performance made without any factory assistance whatsoever, and by a party unaffiliated in any way with our organization, is a complete proof of the excellence of the Locomobile. A later chapter of this book containing a large number of endorsements of the Locomobile doubtless will give a better idea of the record of our car than anything else. The published record of performances of a car in public competitions, owned by the maker, and driven by his own men, may be exceedingly valuable and impressive, but the record of a car in the hands of the owner is the *final* test.

The Locomobile Organization. In purchasing an automobile it is important that a good car be selected which is actually built by the makers; the owner thus obtains a machine built precisely and carefully, in which the maker has a keen and continued interest. It is important to select a good car; it is equally

important to consider the character of the organization producing it—its experience, and reputation for taking care of its customers.

The Locomobile organization is composed of men who have been associated with it since its foundation. Practically all department heads of the Locomobile Company have been with the organization since its foundation. It is inevitable that a car produced under such favorable conditions will be a good car and will continue to be a good car, and that the service accorded to the customer will be good service and will continue to be good service. In buying any article of importance the purchaser always prefers to consider first, some company with a reputation for fair dealing; and if this is ordinarily a desirable thing, it is vastly more so in connection with the purchase of an automobile, as from the very nature of its use, and the utility character of the car, the customer and manufacturer are bound to be closely associated with each other. We believe that Locomobile service is as important and as satisfactory as the Locomobile.



CHAPTER TWO

MODEL "L" CAR

The "30" Locomobile, Four-Cylinder, Shaft-Drive. Type "L", Limousine. Seats six passengers
Price, $4600, with demountable rims

CHAPTER TWO

THE "30" LOCOMOBILE, TYPE "L". FOUR-CYLINDERS, SHAFT-DRIVE

Many experienced motorists believe that the ideal automobile of the future will be moderate in size and power, but of the highest quality of material and workmanship. They consider the small car inadequate for hard daily service and too light to ride comfortably; they regard the large car as the most luxurious type, though not the most convenient and economical for ordinary service.

To such motorists the 1911 "30" Locomobile will make a strong appeal. It is a dependable car for all-round service, an ideal vehicle for the purchaser who desires neither a small car nor a large one, but who demands safety and freedom from trouble above all other considerations.

The best features of both types are combined in the "30" Locomobile. It has every advantage of the small car: economy, facility of operation, and handiness for city use, as it can be turned without backing in a 35-foot street.

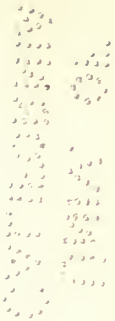
The demountable tires are large, and the weight properly distributed, so that tire trouble

is practically eliminated and tire wear reduced to a minimum.

The "30" has an abundance of power for all purposes, and is used with invariable success on protracted tours, both here and abroad. Each motor is required to develop 38 horse-power; the four-speed transmission enables the operator to select instantly the proper gear for any road condition. A wheel base of 120 inches, combined with an excellent spring suspension, large tires, and proper balancing of weight, produces a most comfortable car — one that rides very easily and steadily at all speeds. It has sufficient weight to make it a luxurious automobile, yet it is not so heavy as to be hard on tires or fatiguing to drive. The "30" Locomobile runs quietly and smoothly, picks up rapidly, climbs all hills satisfactorily, and is equipped with powerful brakes.

All bodies for the 1911 "30" Locomobile are of the new four-door type, giving greater protection from dust and wind to the occupants of the two front seats. Open bodies are upholstered in the best water-grained hand-buffed leather.

A folding and adjustable foot rest is provided, also a sliding coat rail made adjustable to suit the quantity of wraps to be carried. The equipment includes folding cape top of specially selected, durable waterproof cloth, with side curtains, front curtain



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The "30" Locomobile, Four-Cylinder. Type "L", Touring Car. Seats five passengers
Price, $3500, with top and demountable rims

SPECIFICATIONS OF THE "30" LOCOMOBILE

TYPE "L" TOURING CAR

MOTOR

Four-cylinder. Bore, 4½". Stroke, 4½". Horse-power by A. L. A. M. Formula, 32⅔.

CARBURETER

Locomobile design and construction. Float feed, single jet type.

FUEL SUPPLY

18 gallons, gravity feed.

IGNITION

High-tension, dual system, imported.

COOLING

Honeycomb radiator with gear-driven centrifugal pump.

LUBRICATION

Force feed from oiler through hollow crank shaft.

OIL CAPACITY

Engine oiler, .9 gallons. Extra oil tank, 1.3 gallons.

TRANSMISSION

Four-speed selective transmission with bronze gear case.

CLUTCH

Leather faced cone.

DRIVE

Propeller shaft-drive through bevel gears and live axles.

FRAME

Pressed alloy steel, heat-treated.

SPRINGS

Semi-elliptic, alloy steel. Front, 38" x 1¾". Rear, 48" x 1¾".

AXLES

Front, I-beam section. Rear, full floating type with alloy steel tubes and live axles.

WHEELS

Artillery type, 34" in diameter.

MEASUREMENTS

Wheel base, 120". Extreme width, 5' 5". Length, over all, top lowered, 14' 6". Extreme height, top raised, 7' 4".

TIRES

Demountable type. Front, 34" x 4½". Rear, 34" x 4½".

BODY

Four-door Touring Car, seating five passengers.

UPHOLSTERING

Hand-buffed leather, tufted.

FINISH

Optional within reasonable limits.

EQUIPMENT

Close-coupled headlights with gas tank. Combination oil and electric side lamps and rear lamp. Storage battery, top, horn, jack, tool bag and kit of tools. Tire carrier, tire tools, tire pump, tire repair kit. Coat rail, foot rest, storm apron for front seat.

PRICE

$3500, including above equipment.

and cover, also storm apron for front seat. The customer is given his choice of colors, enabling him to have a car that is an expression of his own personal taste. The lamp equipment includes acetylene headlights with gas tank, and combination oil and electric lamps at the sides and rear.

Closed bodies are upholstered inside with the finest quality morocco leather or imported cloths of handsome pattern and delicate shading, finished off with rich laces, made to order specially to match the material. The front seats are upholstered in durable hand-buffed leather. The windows are of plate glass with silk curtains on spring rollers. The front division is composed of three glass frames and the wide center frame can be lowered. The side windows can be dropped when desired. An electric dome light with frosted glass is placed in the roof and operated by current from a storage battery. A speaking tube enables the owner of the car to give instructions to the driver. All inside fixtures are gun metal. A toilet set and other accessories are included in the equipment, all of the best quality and made to harmonize with the luxurious character of the car.

Doors are wide, carefully swung, and open wide, affording ease of exit or entrance and are provided with locks so they can be fastened when car is left standing. The "30" touring chassis with heavier springs, carries the standard "30" limousine and landaulet bodies.

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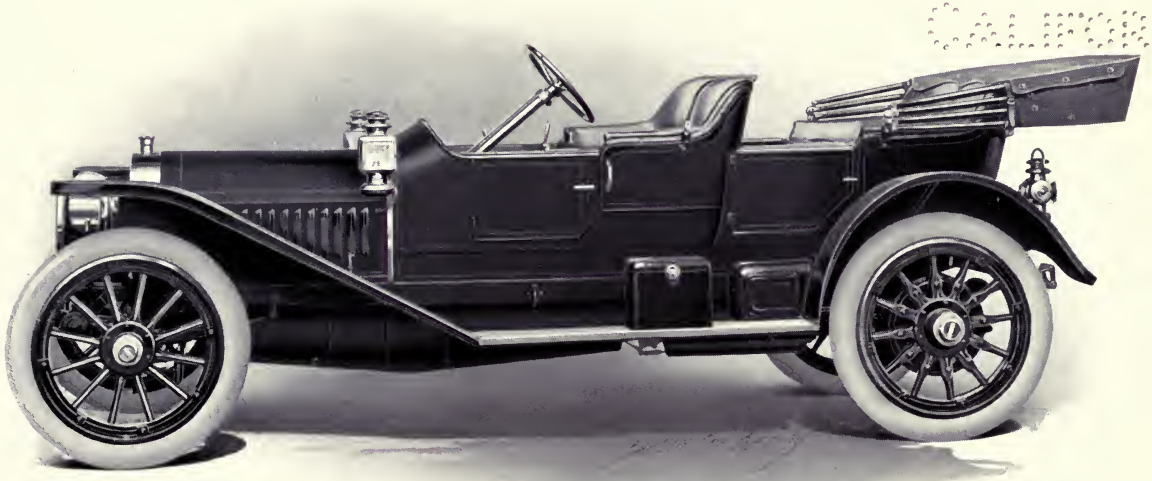
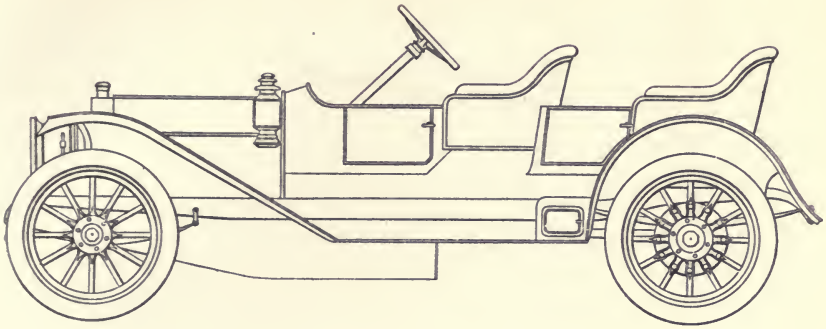


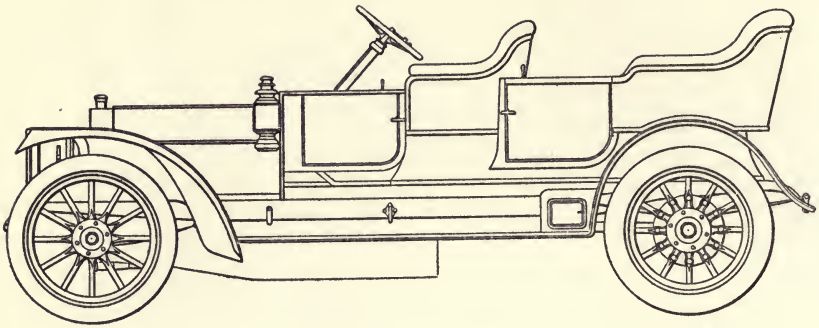
The "30" Locomobile, Four-Cylinder. Type "L", Baby Tonneau. Seats four passengers
Price, $3500, with top and demountable rims



The "30" Locomobile, Type "L", Baby Tonneau. Four-cylinder, shaft-drive. Equipped with 34 x 4-inch tires, front and rear. Price, $3500, with top and demountable rims

This model is an attractive example of the "Roadster" type, wherein the steering column is inclined at a sharper angle than in the Touring Car, the hand levers are placed farther back on the frame, and the seats are lower. The result is a car of trim smartness, a model particularly suited to those who like to drive their own cars.

The "30" Baby Tonneau body is an example of the new enclosed front, so popular for 1911. The rear portion of the body is in the form of a light two-passenger tonneau mounted on an artillery box. If desired the tonneau can be quickly removed, making a two-passenger runabout with a flat deck at the rear, on which can be carried luggage and extra tires. This arrangement is convenient and practical.



The "30" Locomobile, Type "L", Touring Car. Four-cylinder, shaft-drive. Equipped with 34 x 4½-inch tires, front and rear. Price, $3500, with top and demountable rims

There is no more popular type than the open touring car with five-passenger body. Our "30" Touring Car for 1911 is equipped with a very handsome body of the four-door type, seating five adult passengers very comfortably. It is handsome and commodious in every respect, with fifty-one-inch rear seat, and plenty of foot room in the tonneau. The front seat is divided, the partition having a compartment for gloves, goggles, and other small articles. The front doors are so designed and made that they can be removed if desired.

In this and other illustrations that follow, the treatment is by pure outline, omitting top, so as to accentuate the beauty of body design and its harmony with the chassis. For a photographic view of the "30" Touring Car see page 50.

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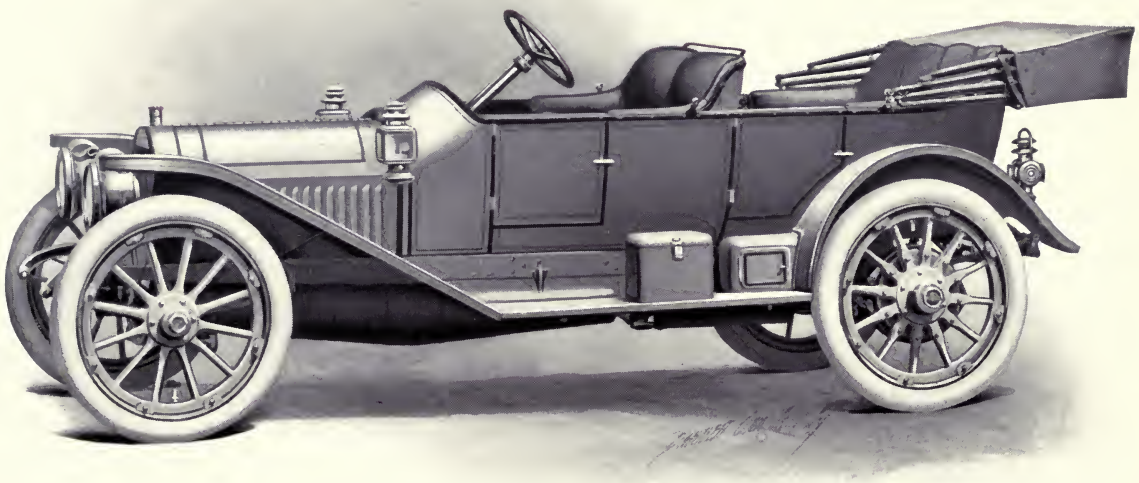
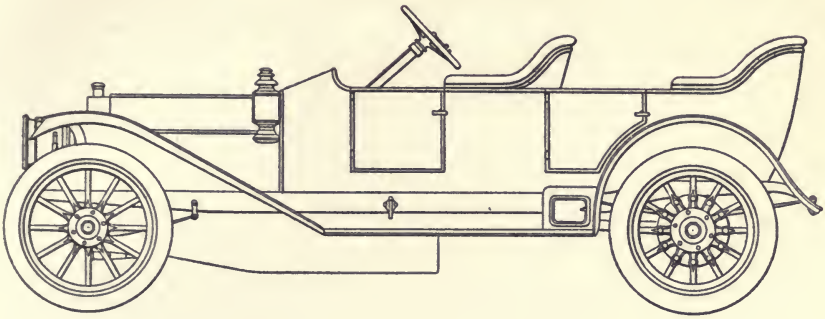


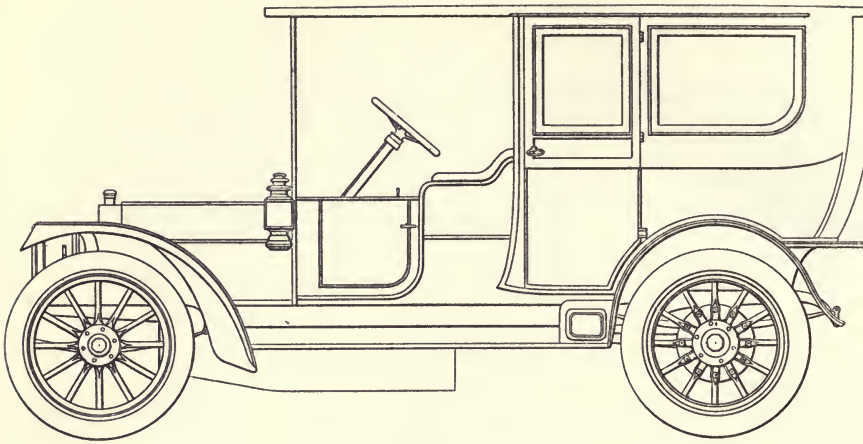
The "30" Locomobile, Four-Cylinder. Type "L", Torpedo. Seats four passengers
Price, $3700, with top and demountable rims



The "30" Locomobile, Type "L", Torpedo. Four-cylinder, shaft-drive
34 x 4-inch tires, front and rear. Price, $3700, with
top and demountable rims

This model consists of the "30" Roadster type of chassis, equipped with a very graceful flush-sided body seating four passengers. The name "Torpedo" is most often applied to this type of body because of the similarity of its construction to that of a speed boat. The sides are smooth like the freeboard of a racing yacht, and the side lines have a gentle curve from front to rear, with the widest part in the center of the body.

The seats are upholstered in smooth leather, the best quality hand-buffed stock. Seating capacity is provided for four passengers.

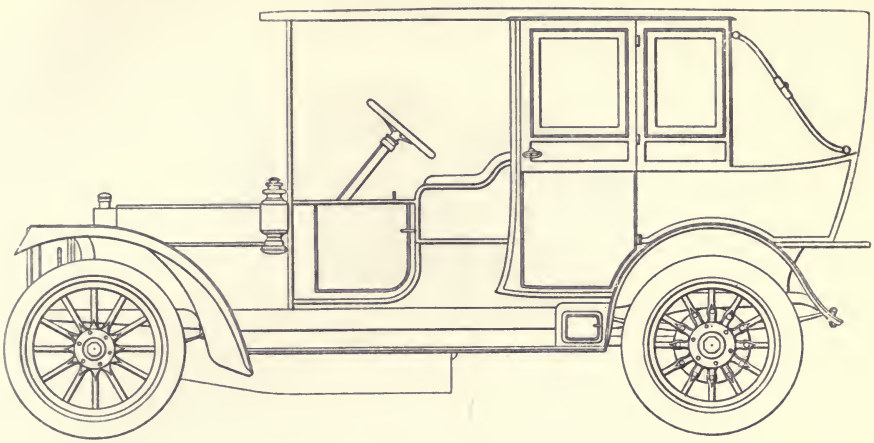


The "30" Locomobile, Type "L", Limousine. Four-cylinder, shaft-drive 34 x 4½-inch tires, front and rear. Price, $4600

Numerous advantages combine to make this handsome model the logical choice of the purchaser who wishes a closed car for all-round service. It is convenient for city use, as it can be turned without backing in a 35-foot street. It is amply powerful for touring and is perfect for suburban driving near a large city. It is provided with a chassis so reliable and durable that it is always ready for use.

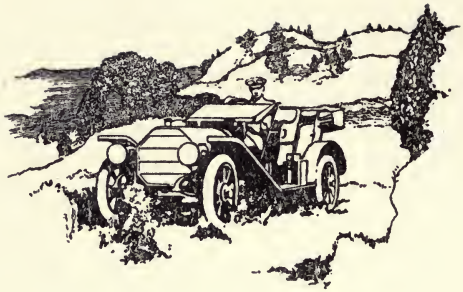
All seats face forward and four or five passengers can be carried inside. It is beautifully upholstered, richly finished and completely equipped. It is illustrated photographically, both exterior and interior, on pages 46 and 66.

The "30" Locomobile, Four-cylinder. Type "L", Landaulet. Seats six passengers
Price, $4700, with demountable rims



The "30" Locomobile, Type "L", Landaulet. Four-cylinder, shaft-drive. Equipped with 34 x 4½-inch tires, front and rear. Price, $4700

The Landaulet has always been a fashionable carriage type, much used for boulevard and park driving. It is a type of body admirably suited to the automobile chassis, because it partakes of the advantages of the open car and the Limousine. When the rear portion is raised and in position the body affords all the comfort of the closed car; when the top connections are unfastened, the top lowered and the windows dropped, the advantages of the open car are obtained. This body is a fine example of coach building and every precaution is taken with the building of the folding top to make it water-tight under all conditions. Selected top leather of the finest quality is used.



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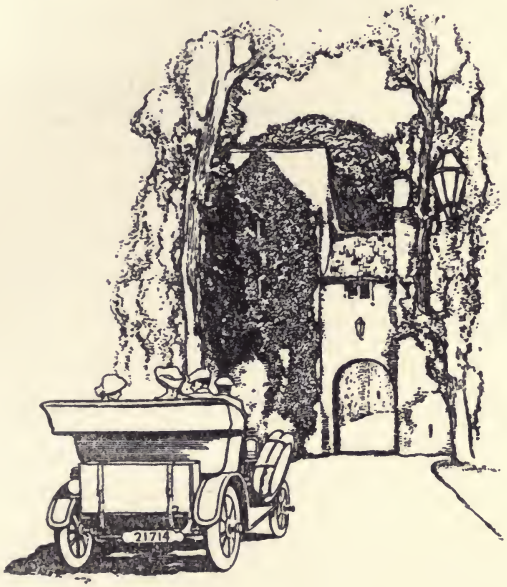
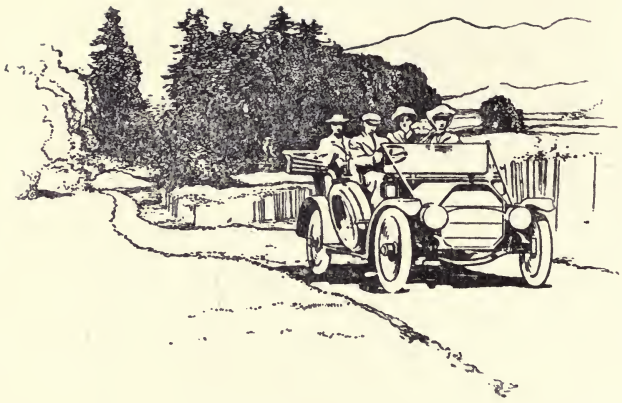
Interior Views of Limousine

CHAPTER THREE

MODEL "M" CAR





CHAPTER THREE

THE "48" LOCOMOBILE, TYPE "M" SIX-CYLINDER, SHAFT-DRIVE

This is an entirely new model, presented in 1911 for the first time, yet is the result of four years of experiment and study. It will recommend itself particularly to those who seek the utmost in luxury and comfort. Although a new car, it is a typical Locomobile in strength of construction, durability, and safety; and the chassis has the same desirable features that have characterized the Locomobile product in past years. Careful students of automobile design declare that the abilities of the six-cylinder motor in the direction of flexibility and freedom from vibration cannot be fully attained by the four-cylinder motor of fewer parts. The new Type "M", six-cylinder Locomobile, has exceptional advantages. An improved system of carburetion is one of the strong features of the car, making it powerful and speedy, yet at the same time economical in the use of gasolene. Another feature is the compact construction of the motor, which results in a short bonnet, doing away with the ungainly effect heretofore peculiar to the six-cylinder automobile. The bonnet of the Type "M" Locomobile is only

5 inches longer than the bonnet of the four-cylinder, seven-passenger "40" Locomobile.

The new "Six" is equipped with high-tension dual ignition, reliable in operation, and affording easy starting of the motor. The shaft-drive features are those of the highly successful "30" Locomobile.

The "48" Locomobile, Type "M", is intended particularly as a seven-passenger touring car of the greatest refinement of operation. The wheel base is 135 inches, and excellent spring suspension and careful distribution of weight make it a car of the greatest luxury and comfort.

The new six-cylinder Locomobile is speedy, very powerful on hills, and has an especially wide range of action on fourth speed by means of the throttle. Such a car will exactly meet the requirements of many of our old customers, as well as those of other motorists who have never owned a Locomobile. Both open and closed bodies will be of the new four-door type, of the finest quality, showing the most careful attention to every detail of equipment and finish. The wheels are equipped with demountable tires, 36 x 4-inch front and 37 x 5-inch rear. In a car of this size it is not practical or proper to use the same tire on all four wheels. A substantial tire carrier has been placed at the rear of the car, in which may be carried one extra front tire and one extra rear tire, both mounted on rims and

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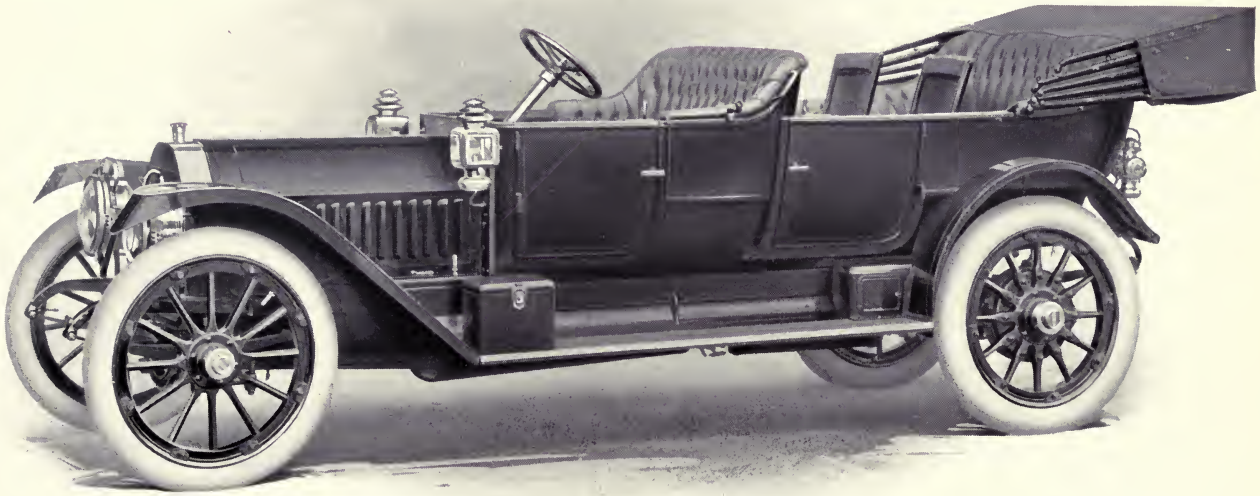


The " 48 " Locomobile. Type " M ", Touring Car. Seats seven passengers
Price, $4800, including top and demountable rims

SPECIFICATIONS OF THE "48" LOCOMOBILE

TYPE "M" TOURING CAR

MOTOR
Six-cylinder. Bore, 4½". Stroke, 4½". Horse-power by A. L. A. M. Formula, 48⅜.

CARBURETER
Locomobile design and construction. Float feed, single jet type.

FUEL SUPPLY
23 gallons, gravity feed.

IGNITION
High tension, dual system, imported.

COOLING
Honeycomb radiator with gear-driven centrifugal pump.

LUBRICATION
Motor has self-contained oiling system. Gear pump forces oil from reservoir to bearings in constant stream.

OIL CAPACITY
2 gallons, motor. 1½ gallons, auxiliary tank.

TRANSMISSION
Four-speed selective transmission with bronze gear case.

CLUTCH
Multiple disc.

DRIVE
Propeller shaft-drive through bevel gears and live axles.

FRAME
Pressed alloy steel, heat-treated.

SPRINGS
Front, semi-elliptic, 38" x 2". Rear, three-quarter elliptic, 48" x 2". All alloy steel.

AXLES
Front, I-beam section. Rear, full floating type with alloy steel tubes and live axles.

WHEELS
Artillery type, 36" in diameter.

MEASUREMENTS
Wheel base, 135". Extreme width, top lowered, 5' 7½". Length over all, top lowered, 16' 3". Extreme height, top raised, 7' 5½".

TIRES
Demountable type. Front, 36" x 4". Rear, 37" x 5".

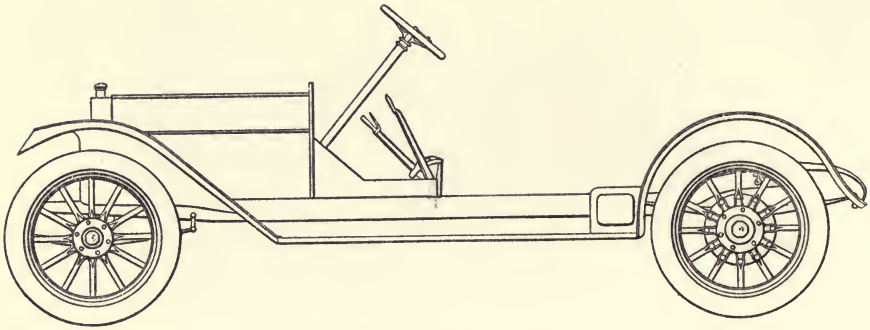
BODY
Four-door Touring Car, seating seven passengers.

UPHOLSTERING
Hand-buffed leather, tufted.

FINISH
Optional within reasonable limits.

EQUIPMENT
Close-coupled headlights with gas tank. Combination oil and electric side lamps and rear lamp. Storage battery, top, horn, jack, tool bag and kit of tools. Tire carrier, tire tools, tire pump, tire repair kit. Coat rail, foot rest, storm apron for front seat.

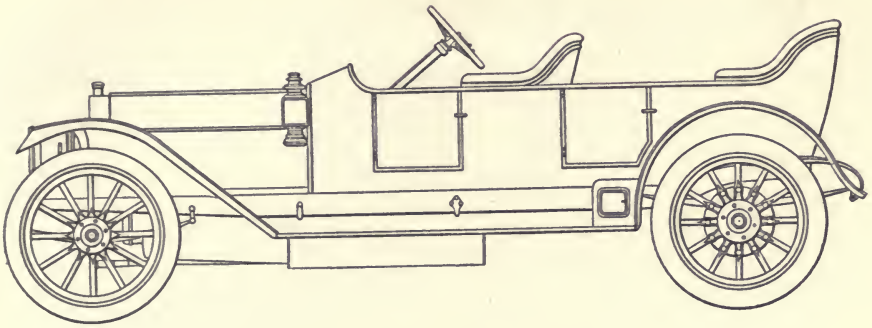
PRICE
$4800, including above equipment.



The "48" Touring Chassis

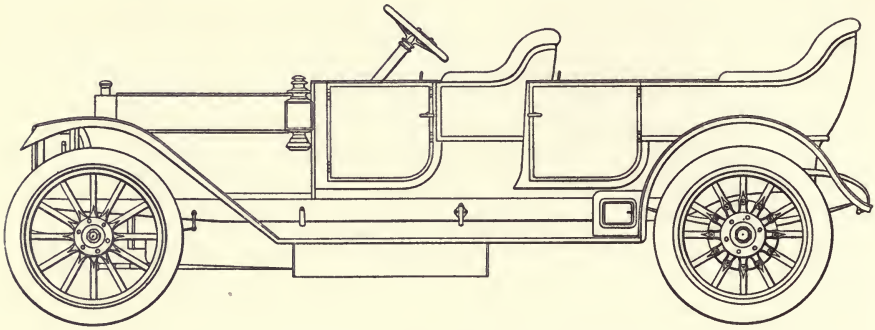
inflated for use. All cars are equipped with large and powerful acetylene headlights and gas tank for same, combination oil and electric lamps at sides and at rear. A folding cape top of the best quality of waterproof cloth with detachable side and rear curtains are included in the equipment at the list price, also a rubber boot or storm apron for the front seat, which fastens under the steering wheel. A complete set of tools is furnished in a neat tool bag, together with certain extra parts.

The "48" Locomobile, Type "M" chassis, is produced in touring car and roadster form. In the latter, the steering column is inclined at a sharper angle than in the touring car, and the hand levers are placed farther back on the frame. Luxurious closed bodies are placed on the Standard Touring Chassis, with heavier springs to carry the increased load.



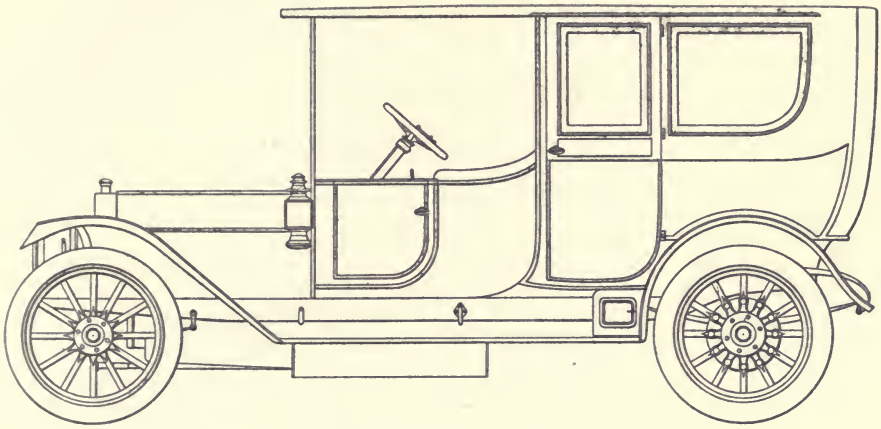
The "48" Locomobile, Type "M", Torpedo. Six-cylinder, shaft-drive
Tires, 36 x 4 inches, front, and 36 x 4½ inches, rear.
Price, $4800, with top and demountable rims

This model consists of a very attractive torpedo body placed on the Type "M" roadster chassis, in which the angle of inclination of the steering column is greater than that on the touring car chassis, the levers are placed farther back on the frame, and the seats are lower. This car is an excellent example of the type of automobile which is designed with a view to being operated largely by the owner. Seating capacity is provided for four passengers, two in front and two in the rear, and all seats are comfortably upholstered in tufted hand-buffed leather. This model is illustrated photographically, on page 118.



The "48" Locomobile, Type "M", Touring Car. Six-cylinder, shaft-drive Tires, 36 x 4 inches, front, and 37 x 5 inches, rear. Price, $4800 including top and demountable rims

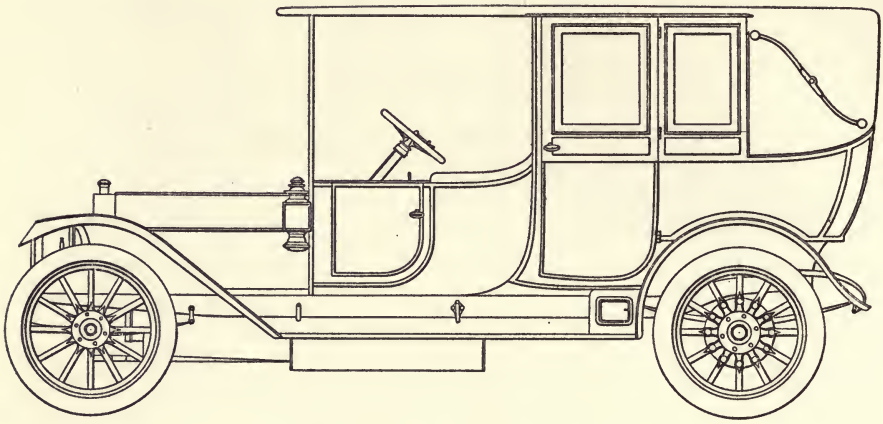
This model is the "last word" in luxury and refinement. It is provided with a handsome body of the four-door type, commodious and roomy, with seating capacity for seven passengers. The design accords with approved style; is refined and elegant. The body is upholstered in hand-buffed leather, tufted, with deep luxurious cushions. The rear seat is very comfortable, with plenty of room for three passengers, and the extra seats in the tonneau are designed for comfort on a long tour, being folded against and secured to the sides of the body when not in use. The illustration of this model and the others that follow are in simple outline, omitting tops, to give a better idea of the body lines. For specifications and photographic illustration, see pages 72 and 73.



The "48" Locomobile, Type "M", Limousine. Six-cylinder, shaft-drive Tires, 36 x 4 inches, front, and 37 x 5 inches, rear. Price, $6050

This new closed car is designed to meet the requirements of those who desire a large and powerful limousine with ample seating capacity for seven passengers. The Type "M" Limousine is very handsome and commodious, seating five passengers very comfortably inside, and having a wide rear seat and exceedingly comfortable extra chairs. As in the "30" Limousine, all seats face forward. The body is a beautiful example of coach building and is very durably constructed.

The inside upholstery is very luxurious, consisting either of tufted morocco leather or imported fabric of handsome design, and finished off with rich laces, made

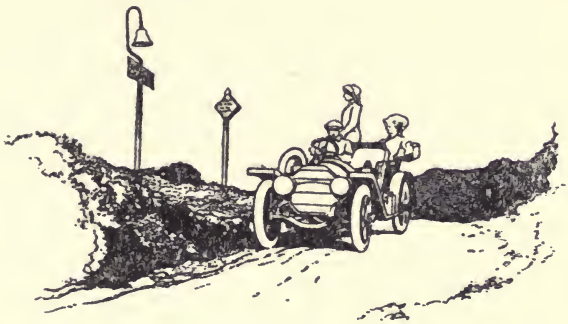


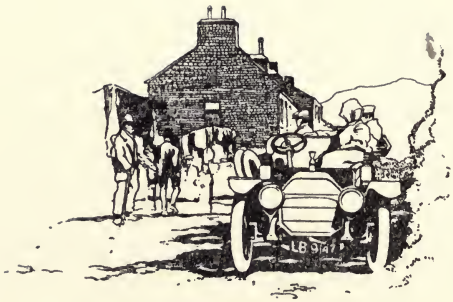
The "48" Locomobile, Type "M", Landaulet. Six-cylinder, shaft-drive Tires, 36 x 4 inches, front, and 37 x 5 inches, rear. Price, $6150

specially to match the upholstery. The front and side windows may be dropped in summer when touring, the rear window being fixed. The equipment provides a speaking tube, an electric dome light with frosted glass placed in the roof and operated by current from a storage battery, as well as a handsome toilet set, arm rests and other handsome appointments. The doors open wide, giving plenty of room for entrance or exit, and are provided with locks, so that they can be secured when the car is left standing. All windows are of the best French plate glass and are provided with silk curtains mounted on spring rollers of a shade to correspond with the other fixtures.

CHAPTER FOUR

ROUND THE WORLD





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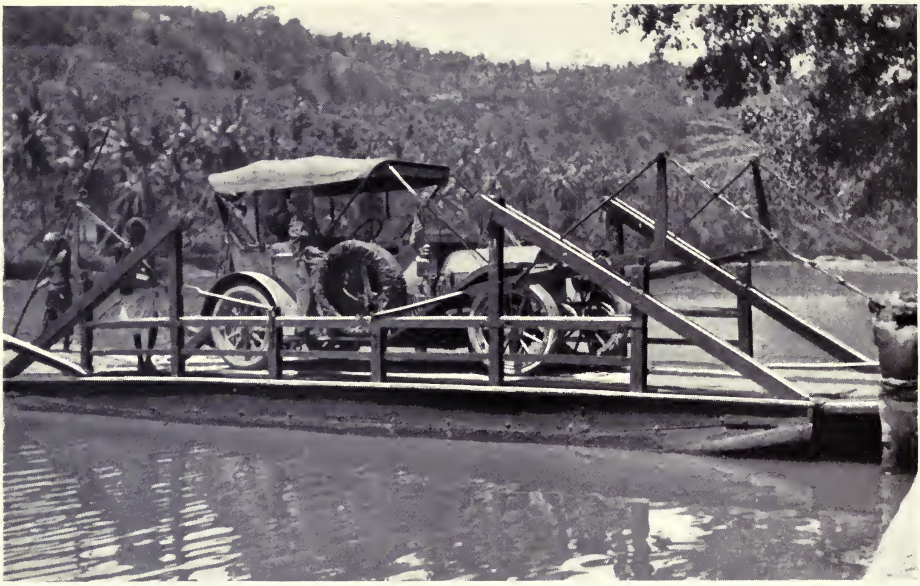

A Ferry in Ceylon

Who has the right of way ? Near Kandy, Ceylon

CHAPTER FOUR

ROUND THE WORLD IN A LOCOMOBILE*

"Mrs. Harriet Clark Fisher started on her world journey, July 19, 1909. It ended on August 16, 1910, making her tour a year and one month lacking three days.

"Mrs. Fisher's party included Mr. Harold Fisher Brooks, a nephew, who has a responsible position in the management of her anvil works, and who drove the car; Albert Bachellor, cook, secretary, and man of all work, and Maria, Italian maid.

"'I had everything built to order with a view to economy of space and weight, at the same time securing all the comfort and convenience possible,' said Mrs. Fisher in describing her equipment. 'I had a celebrated tent maker of Paris construct my tent, and when I called for it, it was all folded and ready for delivery, the maker assuring me that everything was all right. I was not satisfied with buying a tent that way and told him I wanted to see the tent set up and to understand its workings. He said this could not be done except in the street and if he

*The description of this unique trip is taken from an illustrated story printed in the *New York Herald*, August 21, 1910.

attempted that the gendarme would arrest him. I sent my interpreter to the gendarme, who good naturedly consented to allow the inspection, and the tent was spread in the Place Vendome, Paris, attracting a large crowd and several newspaper photographers.'

"'We carried a tent,' said Mrs. Fisher, in describing her equipment, 'several cooking utensils, a large tea basket full of china, and two trunks. We roughed it all along the roads, sending ahead by express, trunks containing clothing necessary for our appearance at social functions.

"'Our tank contained forty-two gallons of gasolene and we had an extra tank under the tonneau, which allowed us to cover 375 miles easily. We had to buy our gasolene and send it ahead to points nearest our stopping places, and frequently go after our supplies in bullock carts.

"'We left New York with eight tires, four on the machine and four extra ones, and strange to say they lasted us throughout our journey until we reached our own country. Then we used up twelve more tires, making twenty all told.'

"Mrs. Fisher was enthusiastic over the fine roads they found in India, where they drove over a stretch of road 1200 miles long and as level as a floor.

"'In Japan the roads were perfect,' she said, 'and in both countries I was given every assistance. In

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A Dāk Bungalow at Burdwan, Bengal, India. One of the Government rest houses

Waiting for Ferry, Kalyan, India. The tires are covered to protect them from the sun

India I was escorted for miles into the country, and, as I went to Japan with the Gaekwar of Baroda and his party, I was treated as a guest of the Mikado, whose emissaries escorted me and furnished me with important maps.'

"Mrs. Fisher was enthusiastic in her praise of her Locomobile.

"'Just to think,' she said, 'we made the trip around the world, over all sorts of roads, across deserts of hot sand, down precipitous mountain sides and through rivers, without mishap more serious than blowing out of tires, and breaking of the pet cock on the oil tank. Our greatest annoyances occurred after our return to our own country. I don't believe that any other car could have stood a stronger test, and I want Mr. Brooks to have all the credit for taking the car over its remarkable journey, for he certainly used rare judgment in handling the machine and getting us out of uncomfortable situations.

"'The only assistance we had to have was in crossing the Tapi River, in Southern India. The Tapi is a broad, shallow river, with sandy bottom—too shallow to require a bridge, and yet too deep for us to get through with our own power. As was the case everywhere we traveled, the government gave us every possible assistance, and you may be sure we were a picturesque group hitched to sixteen pairs of oxen

and escorted by a dozen native policemen, with their heads bound up in great white turbans and splashing bare legged through the water on either side of us. Our luggage and equipment followed us on ox carts, while a curious crowd watched us from the banks, many of the boys following into the water knee deep.'

"Mrs. Fisher has resumed the active management of her factory in Trenton, and it was there in her office, overlooking the Delaware, that the *Herald* reporter found her taking up the threads of business where she left off a year ago. She is proud of her shop and of her men, and takes pleasure in showing one through the plant and discussing improvements. On the river front of the shop is a flourishing cornfield, and it is on this ground that she hopes to build homes for all her men and their families. Romping about the place was her pet Boston bull terrier, Honk-Honk, who made the trip around the world with his mistress.

"'Oh, you must come up to the house and see Billikens,' she said, and into the very machine in which the world tour was made, the big, gray Locomobile, with its paint rubbed off, its sides scratched and its leather parts worn to a frazzle, the reporter was whisked, and the way in which the Fisher home was reached showed that the car had lost none of its speed or power by its twenty-thousand-mile run.

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CALIFORNIA

Crossing the Fuji Rapids, Japan. (Taken in the rain)

A Camp in the Hakone Mountains, Japan. (Taken just after daybreak)

"Billikens is a minute monkey who became a part of Mrs. Fisher's entourage at Ceylon, and immediately became the playmate of Honk-Honk, the Boston bull terrier.

"The Fisher home is now a museum of travel souvenirs and of American Beauty roses, her favorite flower. The most striking souvenir is a collection of miniature figures representing all the servants of an Indian household, and trades people. These were given to her at a dinner in Calcutta. These remarkable little figures are fashioned of native clay, perfect in detail, natural in pose, and draped in most realistic style by the wife of their creator, who is the only artist of his kind in Calcutta.

"'Now that I am back home again,' said Mrs. Fisher, 'I have to look hard at these souvenirs in order to realize that the whole thing has not been a dream. My tour was like a journey through fairyland. I seem to bear a charmed life. Time and again, quite unknown to us, we were on the brink of disaster, but always something interposed between us and what seemed, at least, injury and possible death.

"'Once, in Japan, after we had left Atami and gone through the famous pass outside the city, and were proceeding along the narrow winding road opposite Hakone mountain, something within prompted me to say "stop". We got out of the car and went forward

a few feet to find that the bridge had been entirely destroyed by fire and that foot travelers had laid a few bamboo poles and rubbish across the place to enable them to pass. Had we not stopped at the instant I shouted, we would have plunged over a precipice several hundred feet below to instant death. It was impossible for us to turn back, so we pitched our tent and made ourselves as comfortable as we could on this narrow mountain road, while the men went back for assistance. The government at once sent a small army of laborers and built a new bridge for us. Such courtesies were extended to us on every hand, the Japanese government lending me valuable maps and guide books which I am under an oath to return.

"'Another thrilling experience was that of crossing the Fuji river in Japan. The big Locomobile was run onto a raft built of two boats lashed together and covered with boards. On this we embarked and were in tow of a tugboat, when the bamboo poles holding the tow line parted and the raft drifted helplessly upon the rocks in the middle of the river. The machine could not be gotten off, so a pontoon bridge was built in sections out to the raft and the car run off onto the bridge. Then another section of bridges was built and the car transferred, until they finally landed us on the opposite shore after many hours of labor and anxiety.

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In the sage brush. Nevada, U. S. A.

Where the party stayed at Lucin, Utah

"'But don't think that the tour was one succession of narrow escapes. Far from it. It was rather one continuous and splendid reception, intermingled with amusing incidents from the time I crossed the Turkish border until I left the shores of Japan. It was more the tour of a royal personage than that of a simple American woman traveling for her health.

"'When I left the United States my first objective point was Contrexville, France, where I had planned to take the cure. My few weeks' stay there, where I met many old friends and acquaintances of Europe, with daily automobile trips 'round about and short tours through the country, soon restored me to health. My triumphs began here where my car won the best cup and two medals in an automobile tournament. From here I went to beautiful Lake Como, where I have my villa and keep my American built yacht. Again my good fairy looked after me, for in the annual regatta my yacht, the Carlotta, won the Marchesa Trotti Cup for speed and for being the best decorated yacht on the lake. After this, everywhere I traveled was among and over flowers.

"'I left Italy when the peach trees were in blossom, and toured Japan with the petals of cherry blossoms strewing our path. I have spent many summers at my Italian villa (The Villa Carlotta), and have met and entertained there many notable persons from all

over the world. It was at Como that I met His Highness the Maharajah Bahadur of Benares, who so royally entertained me in India, and through him met His Highness the Gaekwar of Baroda and his interesting family, who invited me to spend several weeks at their palace.'

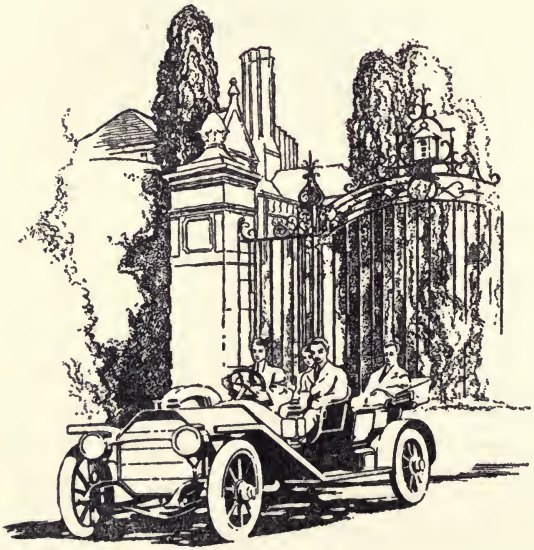
"When her party reached the outposts of the province ruled by Sir Prabnu Narayan Singh, His Highness sent the royal coach, in charge of his private secretary, with two coachmen, two footmen, and two outrunners to meet Mrs. Fisher. When the party reached the Ganges, opposite the palace, Mrs. Fisher was carried from the coach in a 'dandy' by four liveried servants, and boarded the private yacht of the ruler and was ferried across to the marble landing leading up to the palace. The landing and steps were covered with red velvet, and during Mrs. Fisher's entire visit to the potentate her feet were not permitted to touch the earth.

"In his palace she met many of the Indian and British notables and on the occasion of a state dinner Mrs. Fisher was decorated by His Highness, who placed about her neck a necklace of spun gold and red silk, red and gold being the colors of her host.

"Mrs. Fisher was also entertained for several days by the very wealthy merchant, Matilal Nehru and his wife, in their wonderful palace, Anand Bhawan, at Allahabad, India. Mrs. Clark Fisher is the only white woman who ever slept in this beautiful palace."

CHAPTER FIVE

IMPORTANT SERVICE



CHAPTER FIVE

LOCOMOBILES FOR IMPORTANT SERVICE

The strength of the Locomobile chassis is well shown by its record wherever it has been used for important service year after year. There is no more severe test of a car than daily duty, which must be accomplished without fail and without delay. Such conditions do not exist in an ordinary garage where the car is rarely used every day, and where momentary delays are unimportant. We have delivered in the past few years a considerable number of cars intended for important business and municipal service and the demand for these cars resulted from the reputation of the Locomobile for standing up to hard service and doing its work, year after year, in the hands of private owners.

Some years ago we delivered to a large newspaper in Greater New York a standard Locomobile chassis with a light delivery body for the purpose of transferring newspapers from the publishing office to trains and newsdealers in the briefest possible time. The newspaper was the famous *Daily Eagle* of Brooklyn.

It may be stated that in this case the car was a standard 1907 Locomobile 20 horse-power chassis, and that consistent daily service was demanded of it. The

work done by this car was so satisfactory that there are now five cars in use and more have been recently ordered. The original car is still running and giving satisfaction after several years of service.

In December, 1908—three years ago—we delivered to the city of Bridgeport, Conn., a standard 40 horse-power chassis, equipped with a special body having room for eight or ten firemen and a complete chemical engine outfit. After this car had been in use over two years it had answered over 1000 alarms of fire and its record is well described in the following letter from the Bridgeport fire chief, in answer to an inquiry:

FIRE DEPARTMENT

CHIEF ENGINEER'S OFFICE, 274 MIDDLE STREET
NO. 1 CHEMICAL HOUSE

BRIDGEPORT, CONN., February 26, 1910

Dear Sir: In reply to yours of February 10th, would state that we have a Locomobile automobile chemical engine which gives perfect satisfaction. It has been in use about 26 months and has not yet failed in responding to an alarm. It has traveled 2500 miles and has answered 1000 alarms. It took the place of a horse-drawn chemical which reported to alarms of fire within a radius of a mile. The auto chemical covers the entire city, a radius of about 14 square miles.

Its speed is about fifty miles an hour, and it costs about one-half as much to maintain it as it does to maintain a horse-drawn chemical. I consider it a thoroughly practical machine.

Very truly yours,

EDWARD MOONEY, *Chief.*

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A large livery firm in San Francisco uses a number of Locomobiles for daily service

Secretary of State Koenig's Model "L", Locomobile, bought to use in road tests in giving licenses to chauffeurs under new New York State law

The good work done by this car influenced the city of Bridgeport to purchase a Locomobile touring car for the use of the fire chief, as well as a city ambulance, and a police patrol wagon. These cars were standard chassis with special bodies mounted on same. The remarkable performance of the Bridgeport Chemical Locomobile brought inquiries from all over the country and as a result we have delivered a number of similar cars, which have been used with the greatest success and satisfaction. Every large fire must have its incipient stage and if the fire apparatus can reach the point of alarm early enough the fire can be checked before it makes great headway. A strong and speedy chemical engine, like the one in use in the Bridgeport Fire Department, demonstrated this beyond the most sanguine expectations of the fire commissioners. A list of Locomobiles used for important service in a similar manner is given below:

Waterbury, Conn., Chemical Engine.
Waterbury, Conn., Hose Cart.
New Bedford, Mass., Combination Chemical and Hose Cart.
New Bedford, Mass., Chemical and Hose Cart.
Stamford, Conn., Chemical and Hose Cart.
Greenwich, Conn., Chemical Engine.
Greenwich, Conn., Chemical and Hose Cart.
St. Louis, Mo., Salvage Corps Wagon.

St. Louis, Mo., Car for Fire Chief.
Newark, N. J., Salvage Corps Wagon.
Bridgeport, Conn., Chemical Engine.
Bridgeport, Conn., Chief's Wagon.
San Antonio, Texas, Chemical Engine.

The good service rendered by the Newark Salvage Corps Car, has recently resulted in the order for a second Locomobile Chassis to be used for the same duty.

In 1904 Chief Thomas F. Lally, of the Brooklyn Fire Department, purchased a four-cylinder Locomobile for his use in answering alarms. This is still used as a reserve car after six years of work.

We also call attention to the record of the Locomobile in the St. Louis Fire Department. Chief Charles E. Swingley has used the Locomobile car ever since 1905 for his own personal use, and as a result of the good showing the Locomobile made in his hands, a Locomobile chassis was purchased by the Salvage Corps of that city. The last annual record of the Salvage Corps gave the following significant comparative statement:

NO. 1, NO. 2 AND NO. 4 HORSE-DRAWN APPARATUS COMPANIES

Extinguished unaided . . .	Fifteen Fires
Insurance involved	$71,800
Losses paid	348

NO. 3 MOTOR-DRIVEN APPARATUS COMPANY

Extinguished unaided . .	Forty-two Fires
Insurance involved	$250,800
Losses paid	1,572

Chief Edward F. Dahill, of the New Bedford, Mass., Fire Department, answering an inquiry, described the Locomobile chemical and hose cart first purchased by that city, as follows:

We have only one piece of automobile fire apparatus at present, a combination of chemical and hose wagon that was built for us by the Locomobile Company of America, at Bridgeport, Conn. The city is so well pleased with the work of this one that we are at present trying to get the Locomobile Company to build us an auto engine for pumping water, to take the place of steam fire engines.

The writer spent five years working iron and steel, and last October spent one week at the Locomobile plant to get instructed in regard to operating the auto chemical. I was so favorably impressed with the excellence of the materials used and the class of work at this factory, that I take pleasure in stating that I believe Locomobile construction to be equal to if not better than any other American car.

Trusting the above covers your inquiry, I am,

Yours truly,

E. F. DAHILL, *Chief Engineer.*

The satisfactory performance of this car has induced the New Bedford Fire Department to add a similar vehicle to its equipment.

A recent appreciation of the Locomobile is shown by the purchase of a standard "30" Roadster by Secretary of State Samuel S. Koenig, of New York, to be used for the examination of chauffeurs for licenses under the recent New York State law. Such service necessitates a car of standard up-to-date design and able to stand up to hard work every day.

For a number of years Locomobile cars have been used with great success in City Department Service for very important work, as will be indicated by the following list:

New York, Dock Department (three cars).
New York, Board of Water Supply.
New York, Finance Department (two cars).
New York, Department Public Works.
New York, Borough of Richmond.
New York, Department of Gas and Electricity.
Brooklyn Fire Department (two cars).
Brooklyn Police Department (two cars).
Baltimore, Md., Police Department, 4 patrol wagons.
Baltimore, Md., Police Department, Marshal's car.
Chicago, Ill., car for Capt. Richards, South Park Commissioner.
Albany, N. Y., Mayor's car.
Milwaukee, Wis., Board of Park Commissioners.

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Fairmount Hotel, San Francisco
The Locomobile cars used by this hotel for the service of guests

Locomobiles being used by a forwarding company. Illustrates the strength of the Locomobile chassis

The first patrol wagon purchased by the city of Baltimore for use in the Police Department, was found to be so valuable that it enabled the department to dispose of three wagons and eight horses. The car was so efficient that the city ordered three more. The record of this car is very clearly set forth in the following extracts from an address made by Marshal Farnan of the Baltimore Police Department at the Convention of the International Association of Police Chiefs:

"It will comfortably carry 16 men, and in an emergency 21 can be crowded into it. It has been in service a year and in that time has not cost a cent for repairs and has not been out of service a day. Taking it, all in all, and counting its expeditious service, it has proven more satisfactory, more economical and more reliable than the horse-drawn wagons. In performing its services in the Central Station, and other stations to which it has been called in emergencies, it has covered 9000 miles over rough streets, up and down hills and upon all kinds of roads when necessary on 'hurry up' trips to the suburban sections.

"On September 9th last, the second, a 30 horse-power, shaft-drive, was purchased and assigned for use at police headquarters. This last car has proved such a valuable addition to our equipment that I wonder how we got along without it.

"Our department has recently purchased three additional patrol wagons which will be delivered next month and we will welcome their arrival, for they will still further add to our efficiency."

CHAPTER SIX

ENDORSEMENT

CHAPTER SIX

ENDORSEMENTS

A letter of endorsement is valuable only when it comes from some one who has used an article long enough to appreciate its permanent worth.

GREENWICH, CONN., March 14, 1910

The Locomobile Company of America
Bridgeport, Conn.

Gentlemen: Replying to your inquiry of the 15th ult., you are advised that fortunately I am the owner of a 1908 Model "E" Locomobile, No. 1769, purchased through Allen Asten Co., now Allen Brothers.

Furthermore, I use it every day, rain or shine — never have any trouble with it; in fact, for my own use, I would not trade it for any car I know of. I intend sometime to get a larger car, but will not get rid of this one.

Yours very truly,

James Swinson

St. Louis, Mo., April 28, 1910

The Locomobile Company of America
Bridgeport, Conn.

Gentlemen: I had some correspondence with you last winter relative to a trip which I was about to make to Jamaica, and I believe I promised you some photographs.

I spent a portion of January, February and March in Jamaica, and found it an ideal place for winter automobiling. The ships of the Royal Mail Steam Packet Co., or the United Fruit Line Co., carry automobiles uncrated for $35.00 or $40.00, so that it is very easy to take a car from New York.

In Jamaica there are some 2000 miles of roads of good surface. The island, however, is mountainous and a good car and a good driver are the essentials of safe automobiling. The climate is ideal and the scenery very beautiful.

I enclose herewith a number of photographs which I took, all of which show the Locomobile.

Aside from a little tire trouble, we had no difficulty of any sort with the Locomobile, and it continued to prove itself a perfect touring car. Although some of the grades are very severe (one hill, 7½ miles long, rising about 3500 feet), I think during our entire time on the Island we were not on first speed more than 15 minutes. We did most of the hill work on third speed, but where the mountain roads zigzagged it was necessary to take the curves on second speed.

Yours truly,

E. T. Hoyt

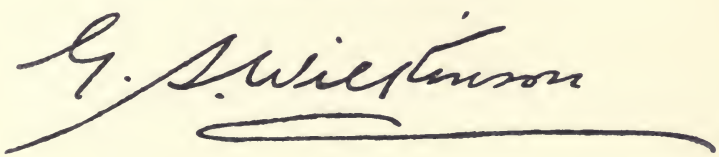
Readiness to run every day without trouble is the principal requirement of most owners.

BROOKLYN, N. Y., February 25, 1910

The Locomobile Company of America
76th Street and Broadway
New York

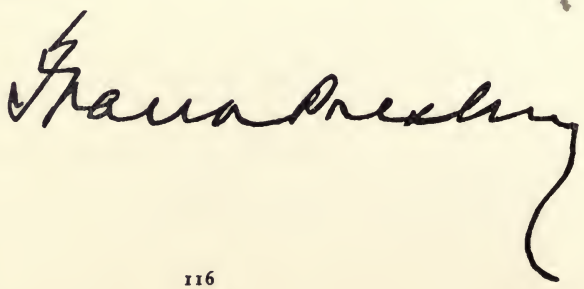
Gentlemen: I am now getting ready for my third year with the little Type "E" car which you rebuilt for me in 1907, and the car is still in excellent condition. I have had no repair bills, and know nothing of "engine troubles". I am now well satisfied that a "used" Locomobile properly overhauled will give more service and more comfort than any new car of the cheaper makes. In covering a distance of four thousand miles I have never *once* had to get out and "see what was the matter". I write because I think it is fair you should know this, and not because I am looking for any favors.

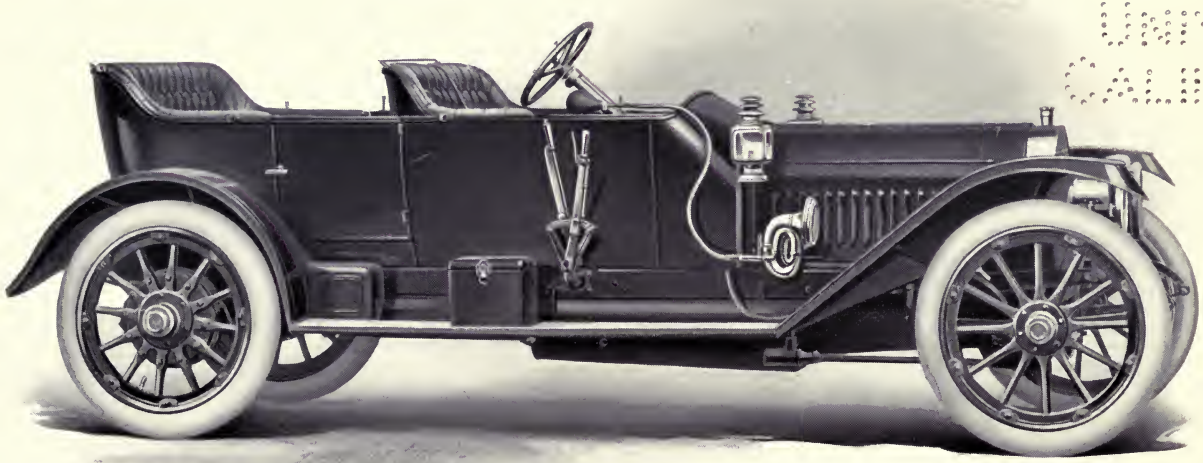
Yours very truly



A Locomobile two years old on a foreign tour. The following is a brief extract from "Motoring Abroad" by Mr. Frank Presbrey of New York. Many motorists have read this charming book. The car Mr. Presbrey took on his foreign trip was a 1905 Locomobile. The tour was made the summer before last:

After visiting the cathedral the morning after our arrival and spending several hours about this quaint, sleepy old town (Winchester), we regretfully got into our car for the last run, one of only about twenty miles to Southampton, where our motor tour was to end. The distance was covered only too quickly, and about noon we drew up in front of the Southwestern Hotel with mingled feelings of regret on the one hand that this most delightful motoring trip was at an end, and thankfulness on the other that it had been made without mishap or accident of any kind. We all took a sentimental pleasure in patting our Locomobile as if it had been a human being and saying: "Well done. You have carried us several thousand miles without default or complaint. So perfectly have you done your work that but once on the entire trip have we had to stop on your account, and that for a moment only."





The "48" Locomobile, Six-Cylinder, Shaft-Drive. Type "M", Torpedo. Seats four passengers
Price, $4800, with top and demountable rims

The Locomobile is a car in which one may tour abroad or in any remote district far away from repair shops, without any fear of trouble.

HOTEL ROSE, WIESBADEN, March 4, 1910

The Locomobile Company of America
Bridgeport, Conn.

Dear Kingman: Upon our arrival here, reeling along (I refer to the car), under strong German benzine we find yours of the 14th ult. with enclosures as stated.

Locomobile running just like silk. Had a little trouble with igniter on first cylinder one day — otherwise the ten-day trip was without skip. The old red car is nearly one year old, was delivered March 16th, I think — and better today after 20,000 kilometers than when first turned over.

We have just completed a ten-day trip from Geneva up through the central portion of France and across the German border, running along the Rhine Valley to this place. I am going to take the cure here, as all Americans do; that is to say, drink the spring water all morning and the good old Pilsner all the afternoon and listen to the band in the evening.

Yours cordially,

John K. Kakers.

London, August 26, 1910

The Locomobile Company of America
New York City

Gentlemen: I have just returned from Southampton where I left my auto with the Morris European Express for shipment to New York.

We have made a tour of 2703 miles since we left Paris, having been in France, Switzerland, Italy, Austria, Germany, France again, and in England. We averaged 127 miles per day while on the continent, and our longest day was 202 miles.

Our highest speed was 56 miles per hour, and our steepest grade was 25 per cent on the test hill at the Brooklands Motor Track. We negotiated it easily on first speed from a standstill and on second with a hundred-foot start.

We had two punctures, two blow-outs, and one tube blow-out that did not hurt the shoe, and except for these tire troubles we did not stop on the road during the whole 2703 miles. It was a wonderful performance and a great credit to your company, for you must remember that the car had done over 20,000 miles before we started on the trip.

The spare parts you so thoughtfully provided are exactly where your packer placed them in the car—we have not used anything, not even a cotter pin or a spare nut.

The car was always ready, and my chauffeur, who has had it ever since you delivered it to me about three years ago, says he thinks the car is running as well as when it was new, and for reliability and hill climbing, he never saw its superior for the same H.-P.

Our trip in every way has been a success — most people had bad weather over here this summer, but we have been most fortunate in this respect — and I am only too sorry that the trip is over.

Very sincerely yours,

George Barclay Moffat

NORTHAMTON, MASS., July 15, 1910

The Locomobile Company of America
Bridgeport, Conn.

Dear Sirs: Enclosed find post-office money order for $1.35 to apply on my account.

Machine is going fine; has never run better since I have owned it. There is certainly great stuff in the Type "D" Locomobile of 1904.

If you have one of the 1910 Locomobile books to spare, would be pleased to receive one.

Yours truly,

H. M. Packard

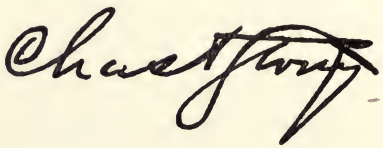
High grade machinery always proves cheapest in the end. The Locomobile is known for its economy of maintenance.

42 Madison Street
CHICAGO, ILL., May 13, 1910

The Locomobile Company of America
Chicago, Ill.

Gentlemen: Inclosed please find my check for $10.32 for repairs on my car. My Locomobile was delivered to me on the 26th of May, last year. I have run it more than 12,000 miles, to be exact, 12,150, and this is the first and only repair expense I have had in that time. In looking over my bill for gasolene I find that I have averaged $10.25 per month — rather economical, don't you think? I have owned five other cars which has given me some experience with dealers. I wish to say that the care, consideration and interest you show your customers was certainly a revelation to me. Thanking you very much for past courtesies, I am,

Respectfully,



EDDYSTONE, PA., Oct. 27, 1910

S. deB. Keim, Manager
The Locomobile Company of America
Philadelphia, Pa.

Dear Sir: During the past ten years I have owned and operated five Locomobiles of various types. Have never yet been delayed on the road except for tire changes, and have never had a car in a repair shop nor out of commission during good riding weather.

From my experience I believe the material and workmanship on the Locomobile to be the most reliable of any American car.

You are at liberty to use my name for reference at any time.

Yours truly,

R. P. Anthony.

The Locomobile is frequently most appreciated in districts where roads are the roughest, and conditions are most unfavorable to the automobile.

405 South Eighth Street
North Yakima, Wash., August 18, 1910

The Locomobile Company of America
Bridgeport, Conn.

Dear Sirs: I wish to write you a few words of praise for the Locomobile car. I drove one of your 1907 cars over a year. The car was used in California and Nevada deserts for nearly a year as a stage car. I took her the third day of last June, 1909, and drove for the largest real estate firm in North Yakima, and up until a few days ago I put on one new spring; one shackle-bolt; two new igniters; one new set of sprockets, the first she had since she left the factory, and one new set of chains; this is the up-keep of a car of good material. You, no doubt, have much better reports of your cars. But if you could only realize the roads I have driven her over. Some days I took her as far as 20 miles on nothing but sagebrush. If tires here last 3000 miles they are good ones. I drove this car over 9000 miles on just such roads. She never has been towed and always comes home.

If all goes well, you will have to send another 40 horsepower, 7-passenger car to North Yakima in 1912. Would like your latest literature.

Yours respectfully,

A. L. Schliesmayer

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CALIFORNIA

A " 30 " Locomobile abroad. Ancient half-timbered house in England

Hiram W. Johnson, of San Francisco, in the " 30 " Locomobile, used in his successful campaign for the nomination for Governor. Car driven over 10,000 miles during the campaign

Dr. Woodrow Wilson used a Locomobile in his campaign for Governor of New Jersey

This Locomobile was driven over 10,000 miles in the greatest political campaign in the history of California, resulting in the nomination of Hiram W. Johnson for governor.

SAN FRANCISCO, CAL., May 3, 1910

The Locomobile Company of America
Hayes Street and Van Ness Avenue

Dear Sirs: I have just returned from a week's trip with my new Locomobile Roadster, and I am so enthusiastic that I cannot refrain from writing you my appreciation of its good qualities. We covered 482 miles on the trip. This distance we covered in a little over eighteen hours running time, and our average speed was 25.55 miles per hour, over roads, good, bad and indifferent, and at no time did we stop the engine. The machine runs perfectly, and gives promise or doing even better than our former Locomobile, which traveled over 48,000 miles, without the slightest mishap, or mechanical trouble. It is necessary in this campaign that we have a machine which I can always feel assured will bring me to my destinations, at the exact times at which I am due there.

Tomorrow I start on a trip through the San Joaquin Valley and thence through the southern part of the State, stopping at every town, and I start absolutely sure that I can depend upon the Locomobile in every emergency.

Yours very truly,

Hiram W. Johnson

The Locomobile is built for safety to withstand the unexpected emergency.

BAKERSFIELD, CAL., Aug. 6, 1910

The Locomobile Company of America
San Francisco, Cal.

Gentlemen: I am mailing you, under separate cover, four views of the recent wreck of my 1907 Model "H" Locomobile from which you will know that the job was done in a very artistic manner.

If you wish to use these for advertising the indestructible features of the "Loco" I will state that the only breakage was the spring clips on the right side of the front spring, which allowed the axle to come back under, twisting the 4-inch blocks and springing the front axle. The body, as you can see, is a total wreck.

After rigging a derrick and lifting the car out of the ditch we removed the blocks from the front axle, put on new clips and the car was driven home, forty miles, on its own power, the engine and transmission being in perfect running order, and none of the wheels had even a cracked or loosened spoke.

Trusting these may be of some benefit to you in a business way, I am,

Yours very truly,

C. E. Getchell.

WILMINGTON, DEL., October 26, 1910

Mr. S. deB. Keim, Manager
The Locomobile Company of America
245 N. Broad Street
Philadelphia, Penna.

Dear Sir: Replying to your favor of the 25th, am pleased to be able to advise that the car delivered to me April 25th has been running continuously and is in every way entirely satisfactory. It has cost me 60 cents for repairs during this period, with a mileage of 5600 miles.

I sent my car to your shop last week after having it at Cape May for four months, which is an extremely hard climate for any machine, due to the dampness, and was much pleased to have your people report that it needed no repairs whatever, and after having the journals and bearings repacked with grease the car is doing wonderful work.

I do not allow any of the garage machinists here to do anything to my car, and for this reason think that I have avoided a lot of expense and complaints that some others have experienced.

I am thoroughly convinced that the Locomobile is the best and most economical car that can be had. Its low consumption of oil and gasolene and the perfect mechanism makes the up-keep of the car a very small matter. Am still using the same air in three of the tires that came with the car.

You are at liberty to refer any probable purchaser to me, and to use this letter.

Yours very truly,

W. M. Francis

An automobile that after three years of service "runs like a clock", is the sort you want.

WASHINGTON, D. C., February 26, 1910

The Locomobile Company of America
Bridgeport, Conn.

Gentlemen: Your constant inquiries of your old customers as to the running of your cars, is much appreciated.

In 1905 I purchased my first Locomobile, ran it for two years and, because of my success with it, I bought a 1907 car, which today runs like a good clock.

You have my promise that if I have occasion to buy a new car, which, owing to the condition of the one I own, will not be immediately, I certainly will buy one of your new models.

Very truly yours,

Charles G. Bennett

The Locomobile is an adequate touring car, capable of going anywhere with comfort, and without being hard on tires.

SAN FRANCISCO, CAL., July 14, 1910

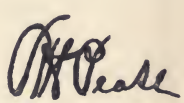
Mr. L. W. Williams
The Locomobile Company of America
Van Ness Avenue and Hayes Street

Dear Sir: Your favor of the 8th instant is at hand, and in reply would state we had a very satisfactory trip in the "I" Locomobile, and I would not wish for a better car than the Locomobile turned out to be.

We went up over the Sierra Nevada Mountains, between seven and eight thousand feet, with grades varying from ten to thirty per cent.

We used "Continental" Type Course Tires, running over one thousand miles, and on our return home the tires were in perfect condition, which demonstrated that the Locomobile for a seven-passenger car is easy on tires. We had a great many rough roads to go over, and by having a car that worked to perfection, and first-class tires, our trip was most enjoyable.

Yours very truly,



The longer a Locomobile owner drives his car, the better he appreciates it.

LOUISVILLE, KENTUCKY, September 9, 1910

The Locomobile Company of America
2000 Michigan Ave.,
Chicago, Ill.

Gentlemen: I have just returned home after a tour through Indiana, Ohio, Canada, Michigan, Wisconsin, Illinois, Tennessee and Kentucky, going over 2100 miles in my Locomobile "30", purchased of you last winter, and while I have always known that I rode in one of the best cars in the market, this particular trip gives additional evidence of the sterling qualities and increases my confidence in the Locomobile.

The sandy roads of Michigan are exceedingly bad and very hard driving, and it takes a good car to travel over them day after day without requiring the slightest adjustment or attention of any kind, but those roads by comparison with the old Louisville and Nashville Pike, over which I traveled, would seem like a magnificent boulevard.

There was not a single broken item on my car during the entire trip.

I have driven my car over 9000 miles up to date and I still like it, and I have no objection to your using this letter to prove to a prospective buyer what some of your users think of your car.

Yours very truly,

There is no element of uncertainty about the Locomobile. It is a car that can be operated every day in the month, year after year.

SAN FRANCISCO, June 25, 1910

Mr. I. J. Morse
The Locomobile Company of America
San Francisco, Cal.

Dear Sir: We have had four (4) Type "I", Forty (40) horse-power Locomobiles in the public service at the Palace Hotel since the opening of the hotel, December 15th, 1909, and can say that the cars have been giving excellent service and doing work that I am confident no other car would do; having made a good many country trips over the hardest roads in the dead of winter, and coming back without a single mishap. In my mind there is no praise too high for the cars we are now using, as the up-keep has been practically nothing.

Wishing you continued success, I am,

Yours very truly,

W. J. Flint.

Chief Engineer Palace Hotel.

Economy of oil and gasolene is noticeable in driving a Locomobile, not merely when it is new but after it has been driven several years.

GREENFIELD, MASS., May 20, 1910

Mr. J. F. Plummer
New York, N. Y.

My dear Mr. Plummer: I think you will be interested to know that I recently made the trip from Greenfield to Boston and return, covering 212 miles, in my "40" Locomobile and averaged 13 miles to each gallon of gasolene. Last Wednesday I left New York in the rain and came to Greenfield, a distance of 206 miles, on an average of 12 7/8 miles per gallon of gasolene. The roads were very muddy and slippery most of the way between New York and New Haven, making it necessary to travel slowly. I don't know that you will consider this remarkable, but I must confess that I do. This is the third year for my car and she is simply perfect. With kind regards, I am,

Very truly yours,

(I write this after nine years' experience with various makes of cars.)

WICHITA, KAN., Oct. 21, 1910

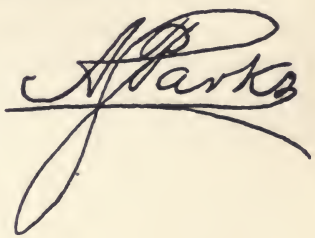
The Locomobile Company of America
Bridgeport, Conn.

Dear Mr. Day: I have just returned from a European trip with my Type "I" Locomobile. Had no troubles or delays of any kind. I traveled extensively through England, Scotland, France, Germany and Switzerland, making this entire trip with no mechanical trouble whatever and only seven punctures all told, and sincerely believe that no other automobile has made such a long and varied trip with the minimum trouble.

I crossed the Alps where the grades are very steep and frequently fifteen miles up grade at one stretch and many cars have great difficulty in making such a long ascent on account of overheating, but I experienced no trouble whatever.

If any of your friends contemplate a trip abroad, tell them to be sure to take a *Locomobile* and join the Automobile Association of London and their troubles will be *nil.*

Yours very truly,



BOSTON, MASS., Oct. 18, 1910

The Locomobile Company of America
Boston, Mass.

Dear Mr. Kingsley: I have just returned from my trip to Europe and possibly you may be interested in hearing a little of it. We started from Havre through France, Northern Italy and Austria, and then through France again to Havre, covering 3063 miles in all. Over 1000 miles of the above were made in trips through the French and Tyrolean Alps.

The car covered the mileage without any trouble of any kind except ordinary tire trouble. This gave us but little annoyance with the demountable rims. We climbed, starting from Grenoble, France, on one day steadily for 51 miles without a let up, spending the night at the French pass known as Le Lauteret on the road from France to Italy. The little inn at this point is 6790 feet above sea level. We continued on the next day, descending about 4000 feet and then climbed the mountain on the Italian side known as Mt. Genevre. The pass at the top of this mountain is 8200 feet above sea level and is the second highest carriage road in Europe.

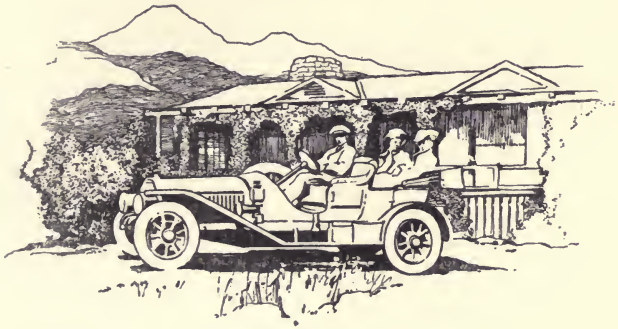
I enclose a picture taken on the French and Italian boundary line. We climbed this without any difficulty whatever, although we passed two cars which were having great trouble on the road and we understand they were all day getting to the top which we covered in a few hours. We could say the same of our trip through the Tyrolean pass over Falzerego, which is even more difficult than the one above. The weather was bad, it being rainy and the road is much steeper in places, although I believe the height is about 8000 feet, about the same as Mt. Genevre.

Yours very truly,

ARTHUR B. GILMORE

CHAPTER SEVEN

THE LOCOMOBILE PLANT



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The Plant of the Locomobile Company of America at Seaside Park, Bridgeport, Conn.

CHAPTER SEVEN

THE LOCOMOBILE PLANT AND MANUFACTURING METHODS

Every year we receive many visitors at our factory, and all interested in the production of high-class automobiles are invited to go over our plant. Anyone who has ever made a careful inspection of the Locomobile plant has carried away something of the spirit of Locomobile ideals of manufacture.

The intention of this chapter is to explain briefly to those who are unable to visit Bridgeport what our factory is like and how we make our cars. The Locomobile plant enjoys what is probably the most beautiful location of any factory in the country, being situated on the edge of Long Island Sound at Bridgeport, Conn., adjoining Seaside Park. The buildings are arranged so that workmen in all departments have plenty of light and air, and it is well known that healthful surroundings have a marked beneficial influence on the quality of work produced in any factory. The situation of our plant in Bridgeport is desirable because this city is the most active industrial center in Connecticut, provides us with skilled New England mechanics and facilities for making shipments by water or rail.

The raw material entering into the construction of the Locomobile is stored in the basement in bins and racks, each class of material having a special place. Before shipments of steel are unloaded from the freight car they are streaked with paint, so that every workman can tell at a glance what the steel is intended for. Every steel has its particular color, and a color board hangs in each department that handles raw material—thus there is no confusion. Every piece of steel is also stamped with a number. Some years ago a famous French firm lost an automobile race because through a factory error the wrong kind of steel was used in making up the engine valves. In the Locomobile factory the practice of painting the steel and stamping it with a number prevents error and makes it certain that each part will be made from the proper kind of steel which will give the best results.

The Locomobile is practically made of drop forgings. We design the parts, and sink the necessary dies. The drop forgings are produced in a very complete shop, equipped with large and small forges, trip hammers, cutters, trimmers and power shears, the raw material being cut in pieces and placed in oil-fed pre-heating furnaces. All forgings are immersed in an acid bath, which smooths off surface roughness, and are also subjected to the action of the sand blast, which cleans off the scale and reveals flaws if there be any.

This operation is more than a mere cleaning process, it is an inspection of great importance. In this section of the factory is located an elaborate heat-treating and annealing department where special facilities are provided for the heat-treatment of alloy steel. This is probably the most complete and up-to-date establishment of its kind in New England, and nowhere in the country is there any excelling it in the ability to accomplish the best results. A more important matter is the fact that this department is long established, having been a feature of the Locomobile plant for six years, and long experience in heat-treating alloy steels enables us to produce parts of uniform and enormous strength. Owing to the sensitive character of the alloy steels used in automobile construction, it is necessary to regulate the heating to the utmost accuracy, therefore this is accomplished in oil-fed furnaces, the temperature of which is indicated by pyrometers or electric thermometers and the oil furnaces enable the exact temperature to be controlled for any length of time. An idea of the magnitude of our heat-treating establishment may be had when it is stated that the consumption of oil for the furnaces amounts to a thousand gallons a day. All drop forgings, all nuts and bolts are heat-treated, as well as all gears, shafts and axles.

The machine rooms constitute a large part of the floor space of the factory as the Locomobile is a car

composed of Locomobile parts. The various manufacturing departments are equipped with the latest and best machine tools, which perform the various operations in the most correct manner. Each machine room has its own inspection room which is under the supervision of the main inspection department. *Accuracy is the rule in the Locomobile plant and all machine operations are carefully inspected and every finished part is inspected.* Some pieces are tested by a blow from a hammer, a clear ringing note indicating the absence of any flaw. Every nut, screw and bolt is examined. These inspections are exceedingly expensive but guarantee high quality and long life of the car.

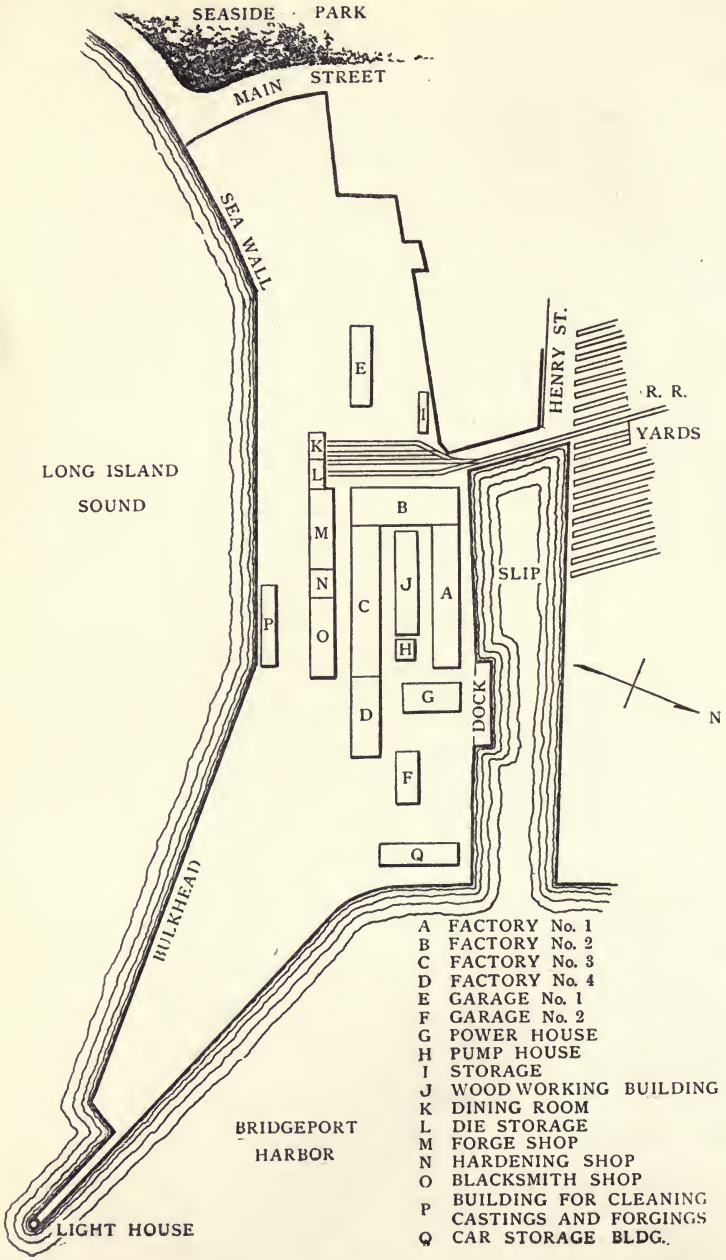
An automobile contains a very large number of bearing surfaces entirely separate from any ball bearings used in the construction of the car, and these must be absolutely true and smooth and of the proper density to resist wear. The proper way to finish wearing surfaces is by grinding and the Locomobile grinding department is noted for the amount and accuracy of the work performed. Locomobile cylinders are bored with great care, the cutting tool moving very slowly so as not to distort the cylinder walls, and three cuts are taken, the cylinders being aged between cuts. The final finish is by grinding, water flowing through the water jackets exactly as in the operation of the car so as to maintain a uniform heat and prevent distortion.

Tuning up the Finished Product. The Locomobile Testing Crew ready for the road

This final operation of cylinder grinding leaves the inside walls absolutely and permanently true and with a hard glassy finish.

In any automobile there are a large number of gears, both spur and bevel — such parts are made in the Locomobile shops from start to finish. Elaborate gear cutting machinery is employed that generates the teeth of the gears, that is, shapes the gear teeth so as to produce the curve called for by theory instead of approximating it in the ordinary manner. Another important matter is that Locomobile gears have been produced in the Locomobile factory for eight years with a corresponding precision to be gained only by such long experience.

We have always built our own engines. Many automobile manufacturers do not build their engines or have only recently begun to do so. (No Locomobile gasolene car has ever been equipped with an engine that was not a Locomobile engine.) Each engine is assembled from parts that have all been carefully inspected and are entirely interchangeable in character. When the engine is finished it is flooded with oil and driven by a belt until it is limbered up, after which it is placed on the testing stand where it is coupled with a dynamo which it drives, and the electrical power developed by the dynamo in consequence is *readily* transformed into horse-power. Each engine


SEASIDE PARK
MAIN STREET
SEA WALL
HENRY ST.
R. R.
YARDS
LONG ISLAND
SOUND
SLIP
DOCK
N
BULKHEAD
BRIDGEPORT
HARBOR
LIGHT HOUSE
A FACTORY No. 1
B FACTORY No. 2
C FACTORY No. 3
D FACTORY No. 4
E GARAGE No. 1
F GARAGE No. 2
G POWER HOUSE
H PUMP HOUSE
I STORAGE
J WOOD WORKING BUILDING
K DINING ROOM
L DIE STORAGE
M FORGE SHOP
N HARDENING SHOP
O BLACKSMITH SHOP
P BUILDING FOR CLEANING CASTINGS AND FORGINGS
Q CAR STORAGE BLDG.

is tested until it fulfills the standard requirements for its type and the record of each engine test is preserved. No greater carefulness could be exercised or stricter methods employed than in the construction of a Locomobile motor.

The transmission gears, an important part of any car, have always been a very strong part of the Locomobile. The transmission is built complete in the Locomobile plant. An exceedingly interesting testing device is used for all transmissions and rear axles. This consists of a stand on which is placed, for example, a rear axle, which is then driven and the conditions of actual road service are imitated to the extent of testing the rear axle for driving and braking stresses and for the silent and satisfactory operation of the driving gears and differential gears. Each transmission is placed on this stand and tested before it is permitted to enter into the construction of the chassis. The cost of operating this testing machine is considerable but as its use is one of the things that make for high quality and durability, it is a feature of Locomobile factory carefulness.

Another interesting department is that in which the chassis is assembled. Here the motor, transmission, axles, steering gear, frame, springs and other components are combined to produce the complete chassis. It has been pointed out that all Locomobile parts are interchangeable, and it is valuable to note that the assembly

of all parts of the chassis frame are also interchangeable as the assembly holes are jig drilled. Consequently any Locomobile motor will fit any chassis and so on for the transmission and other units. When the chassis is assembled it is equipped with a set of wheels and a testing body and is sent out on the road in charge of a testing driver who does nothing else but tune up and inspect the finished chassis. His test is inspected by other men, after which the car is sent to the finishing department to be painted and to have the body and lamps and equipment added. The metal parts of the chassis are enameled instead of painted. The difficulty of making paint stay on the bonnet, for example, which is hot, and on the fenders and other parts which are always subjected to more or less vibration, is overcome by baking on the enamel which makes a perfect foundation for the finishing coats of paint and varnish.

When the car leaves the final department which prepares it for delivery, it is given a road test of sufficient duration to make sure that the car is in proper running condition before shipment. After this the report of this tester is checked by other inspectors. The final test is performed by a special inspector whose regular duty is to examine the car with a view to eliminating any minute imperfections in upholstery, finish, or equipment, so when the customer receives his car it will be not only a perfect mechanical unit, but perfect also in finish.

CHAPTER EIGHT

ORGANIZATION

CHAPTER EIGHT

THE LOCOMOBILE ORGANIZATION

The Locomobile Company of America was founded in 1899, at a time when automobiles were called "Horseless Carriages", and there were few, if any, practical machines in use in this country. Our company was the first in America to deliver automobiles in any quantity. The performance of early Locomobiles was the first convincing demonstration of the value of automobiles, and was the most potent factor in awakening the automobile movement in this country and in stimulating the industry.

It will be seen that our experience in the manufacture of automobiles covers twelve complete seasons, and the Locomobile for 1911 is thus the direct result of all this knowledge. We believe that it is very important for the purchaser to consider something more than the actual car as he sees it on the road. We believe that he should be influenced by the way in which the car has been developed, so that he will get a machine that is the result of experience; we also believe that he should be influenced by the character of the company, buying his car from a concern whose policy it is to take the best possible care of its customers.

New York Branch

The policy of the Locomobile Company is to build the best cars possible and to see to it that they give complete satisfaction in the hands of owners. In order to carry out this policy we have a complete manufacturing plant, fully described in another chapter, and in this plant are located our executive offices, in close touch with the production.

The men composing the Locomobile organization are almost without exception pioneers in the industry. Nineteen department heads of the Locomobile organization have been associated with it for over seven years, and twelve of these department heads have been with the company continuously for over ten years, practically

Philadelphia Branch

since its foundation. As a result there is that wholesome unity of effort and complete understanding which can only result from working side by side for years.

In order best to serve our customers we have established branch houses at important centers throughout the country. It is important to know that this is not a recent departure, but was an original part of our company's policy, for example, our New York branch was established in New York City in 1899 and we have occupied our present building at Broadway and 76th Street for eleven years. This spells permanence and stability and should inspire confidence in the buyer. We have had branch houses in Philadelphia

Chicago Branch

and Chicago since 1900, and one in Boston since 1901. We have recently opened new branches in San Francisco and Washington. Throughout the country are a large number of dealers who handle the Locomobile product and who keep in close touch with the nearest branch house. This system forms a complete chain, enabling the Locomobile owner to tour from one part of the country to the other and always be in touch with the Locomobile Company or a Locomobile dealer.

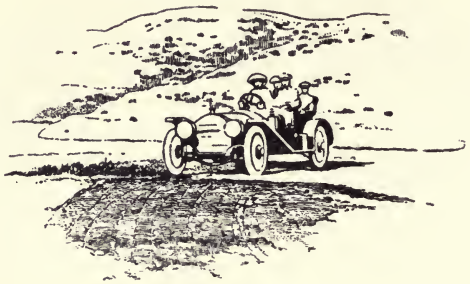
It is an important part of our policy to co-operate with owners to the fullest extent; to do everything we can to make their experiences with the Locomobile thoroughly satisfactory in every way. We endeavor

San Francisco Branch

to keep in close touch with our customers and to handle their correspondence with care and promptness; we keep on hand at our factory and branch houses a complete supply of spare parts and supplies; and from time to time we send mechanical experts to call on Locomobile owners to see that their cars are operating as they should.

Our constant effort is to produce the best car we can and to see to it that the owner obtains from its use the perfect satisfaction it was built to give.

It is important to buy a good car, but it is equally important to buy it from an experienced organization with a reputation for taking care of its customers and with full facilities for doing so.

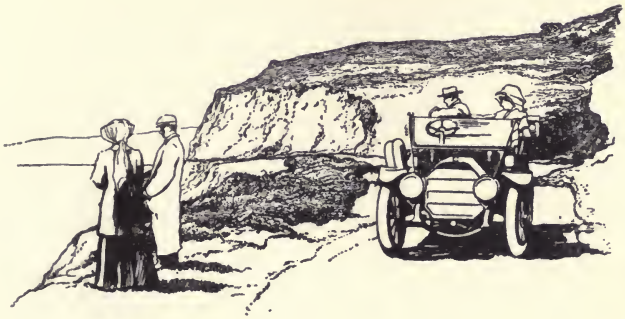


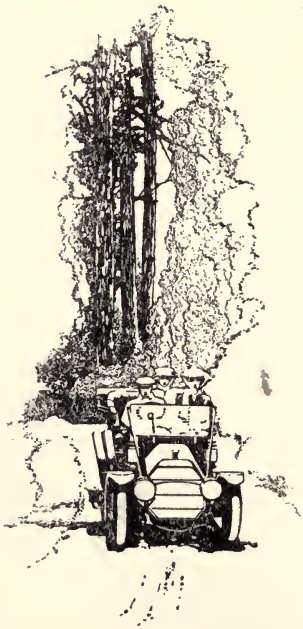
List of Branches

Bridgeport	Seaside Park
New York	Broadway and 76th Street
Philadelphia	245 North Broad Street
Chicago	2000 Michigan Avenue
San Francisco	Van Ness Avenue and Hayes Street
Boston	589 Boylston Street
Washington	1124 Connecticut Avenue

CHAPTER NINE

MOTOR AND IGNITION





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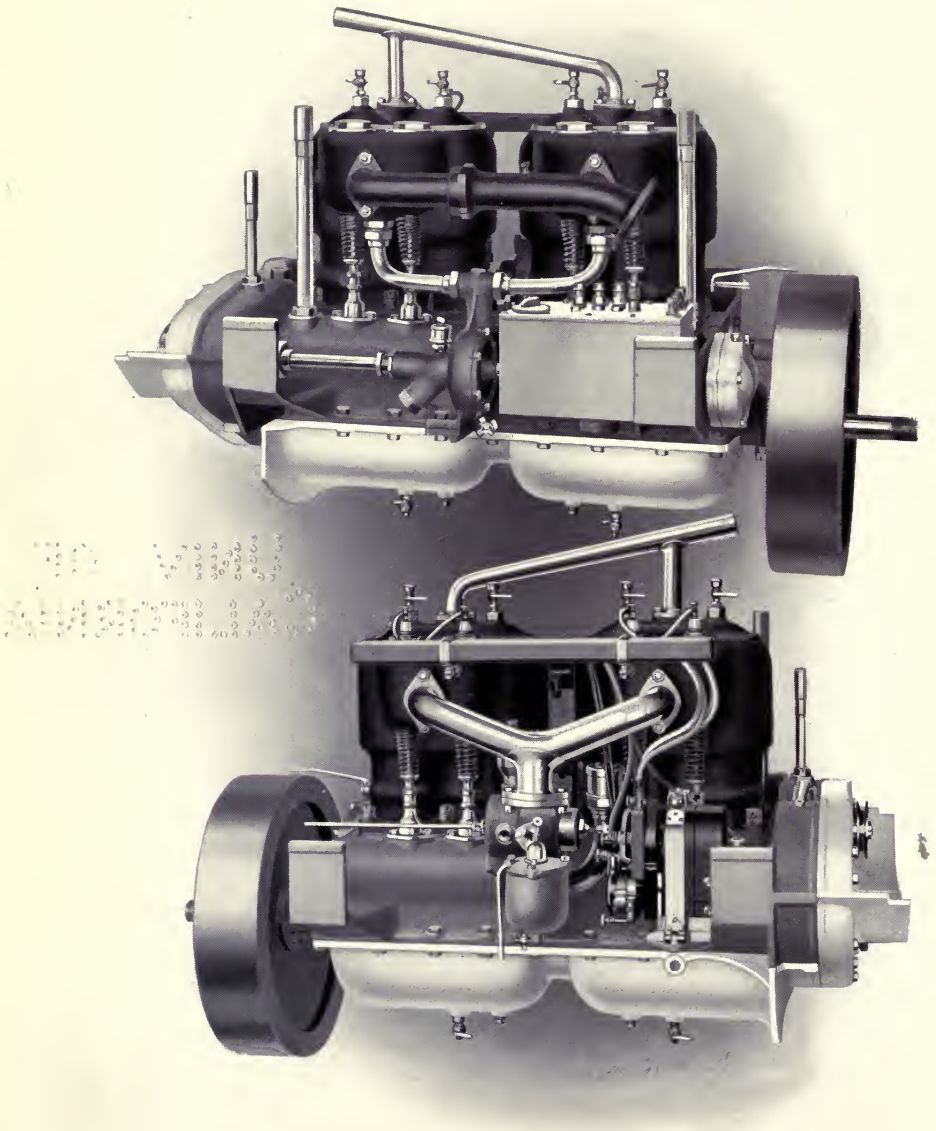

Type "L" Motor, Four-Cylinder

CHAPTER NINE

THE LOCOMOBILE MOTOR

Viewed broadly, the most valuable advantage of the Locomobile motor is its strength of construction. The design is substantial, the quality of material is the best, the workmanship is accurate, and the system of testing is elaborate and thorough. These precautions combine to make a motor that will keep running satisfactorily year after year.

Ignition. The imported high-tension dual system, used on the Locomobile, will be found to give excellent satisfaction and provide easy starting. Following are some of the features:

1. The motor can be started from the seat by pressing a push-button at the rear of the coil on the dashboard.

2. Neat horizontal coil, only one end of which shows on the dashboard. No bulky coil box.

3. Simple system of wiring. Leads from the magneto to the spark plugs are carried along the motor in a neat ebonized container.

4. No external connections between the switch and the coil.

5. Simplicity evidenced by the fact that there is one switch, one contact breaker and one distributor.

6. Highest quality of imported spark plugs. These are mounted in the bronze caps screwed into the openings above the admission valves.

7. The trembler is only used for the purpose of starting the motor. When the car is operated the trembler is cut out and the current interrupted mechanically, thus there is no lag.

8. The magneto, coil, spark plugs, distributor, wiring, and all other parts are the product of one maker.

9. A three-cell, six-volt storage battery of the best quality is provided. This is used to facilitate starting, and is carried on the dashboard in an enameled metal box.

10. The magneto is located on the cooler side of the motor — the admission side — and can be removed and replaced quickly and without disturbing the timing. Positively driven by a gear meshing with the admission cam-shaft gear. Flexible coupling in magneto shaft.

Bronze Base. One of the most interesting details of the Locomobile motor is the substantial bronze base on which the cylinders rest. Bronze makes an absolutely rigid structure, which greatly prolongs the life of the motor. Aluminum, which is commonly used for the purpose, has but one-third the strength.

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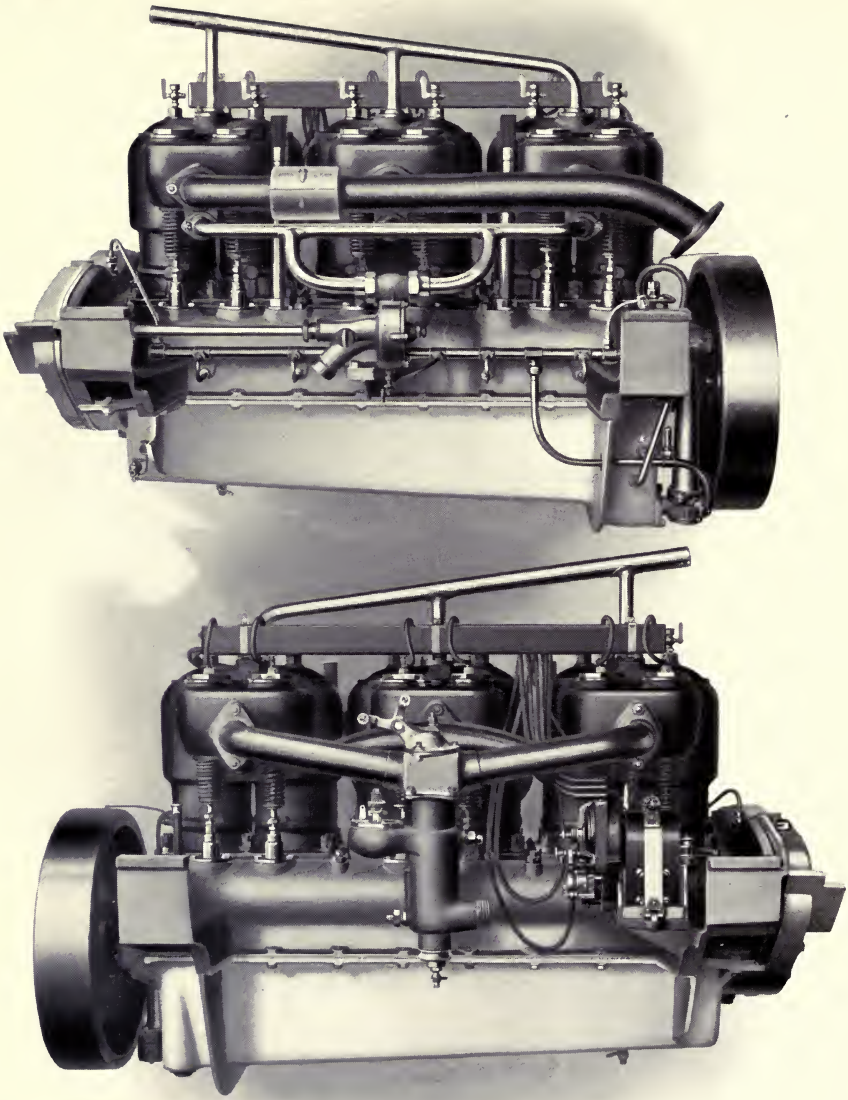
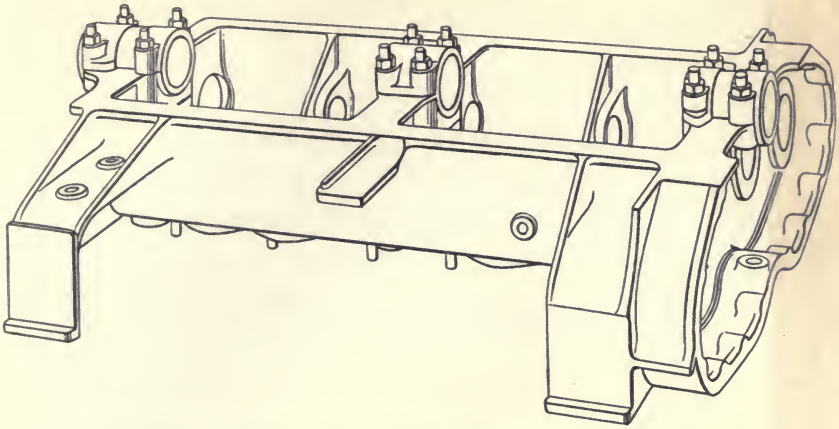
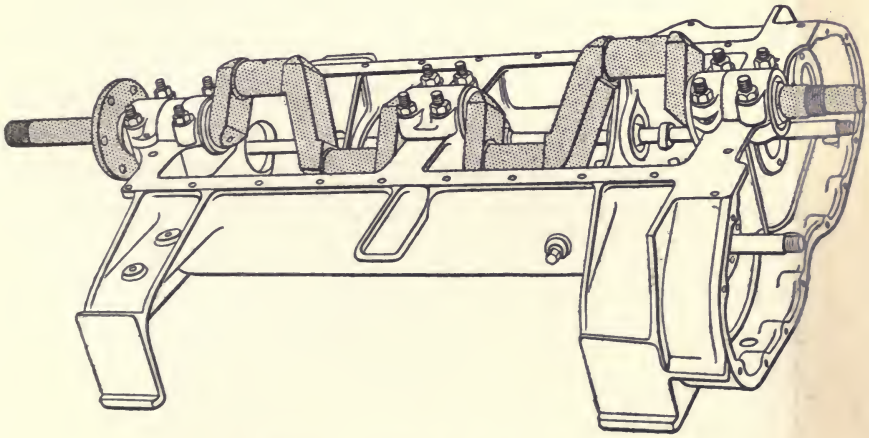


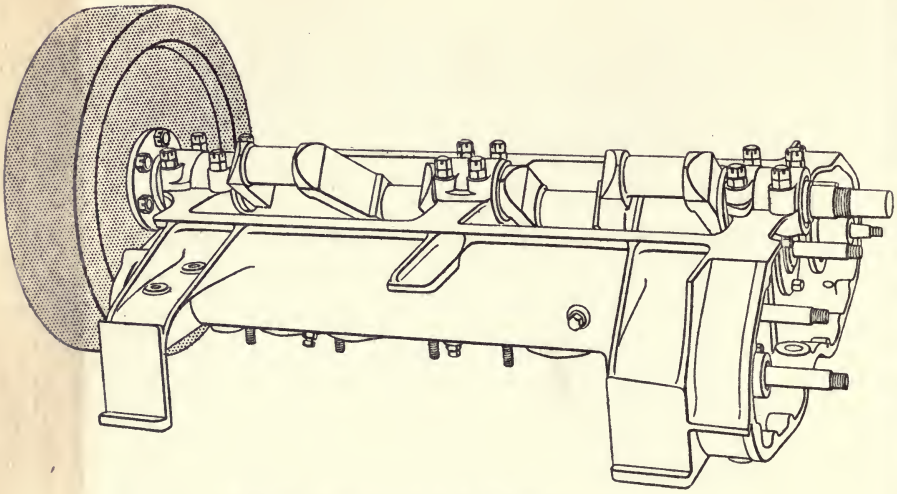
Type "M" Motor, Six-Cylinder



Building the Locomobile Motor, first view. The bronze crank case
(The "30" Locomobile Motor is shown in this series of views)



Building the Locomobile Motor, second view
Crank case turned right side up, and crank-shaft installed, also cam-shafts

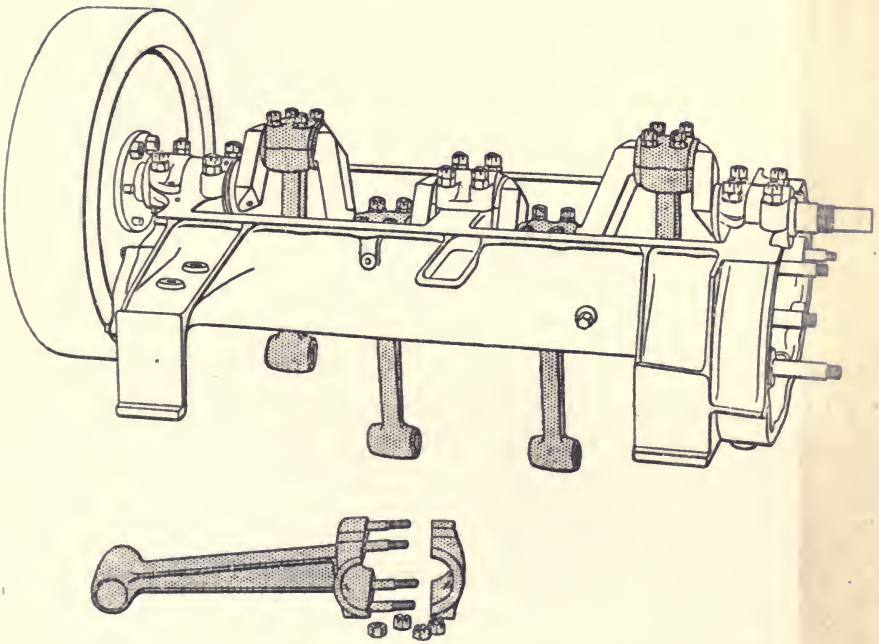


Building the Locomobile Motor, third view
The fly-wheel is bolted to the rear end of crank-shaft

In a bronze base, such as is used on the Locomobile, there is no danger of fracture or of the bearings getting out of line. The bottom portion of the engine consists of an aluminum casting bolted underneath the bronze engine base and used to contain the oil for the lubrication of the motor. Inasmuch as this part of the engine is not subjected to stress, aluminum is used to save weight. In fact, throughout the Locomobile, aluminum is only used where weight may be saved without any sacrifice of strength or durability.

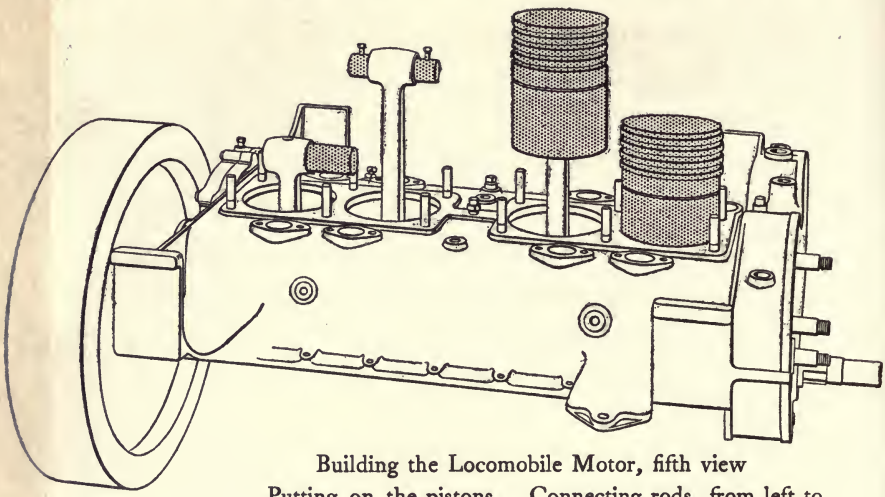
Crank-Shaft. This very important part of the motor is notable for its strength and fine workmanship. The crank-shaft of the Locomobile is a solid bar of alloy

steel, which is first pressed out in rough form on a hydraulic forge and then heat-treated. Machine operations are all carefully performed in the Locomobile plant, each shaft being inspected after each operation. The crank-shaft is machine finished all over, from end to end, whereas in most crank-shafts the bearings only are machined. It is balanced on a testing device with knife blades prepared for the purpose.



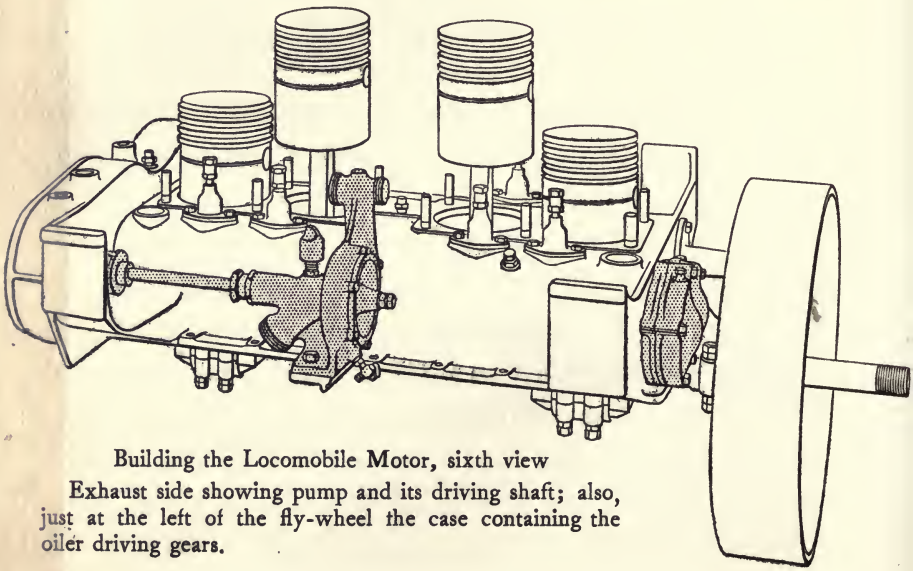
Building the Locomobile Motor, fourth view

Connecting rods are assembled to the crank-shaft. One of them is shown separately, with bearing cap removed



Building the Locomobile Motor, fifth view

Putting on the pistons. Connecting rods, from left to right, show, first, a wrist pin; second, a wrist pin with studs; third, a piston without rings; fourth, a piston with rings.



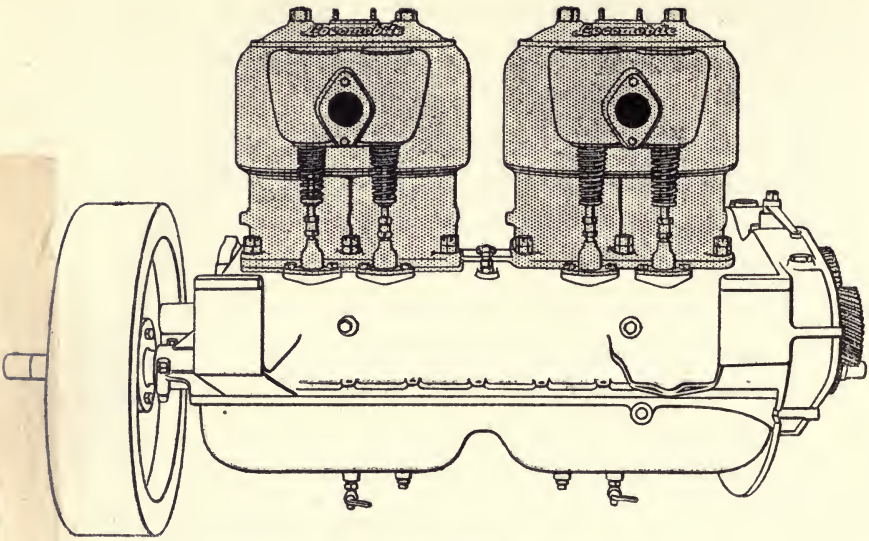
Building the Locomobile Motor, sixth view

Exhaust side showing pump and its driving shaft; also, just at the left of the fly-wheel the case containing the oiler driving gears.

The crank-shaft is forged with a flange at the rear end to which the fly-wheel is secured by six bolts, a method of fastening which absolutely prevents it from working loose. The crank-shaft rests on main bearings of liberal dimensions, perfect alignment being established before the crank-shaft is assembled in its bearings. The bearings of the motor consist of the alloy steel surface of the crank-shaft rotating in bushings of white bronze, compressed to the proper density and highly polished by a special process of our own. The bearing caps are secured by four double lock nuts and cotter pins to each bearing.

Connecting Rods. Locomobile connecting rods are very strong, drop forged from special steel in the Locomobile shops. The bearings of the connecting rod on the crank-shaft are similar in construction to the main bearings, and are made adjustable for wear by thin copper shims. The connections are very strong, the connecting rod bearing caps being secured to the connecting rods by four studs—a nut, lock nut, and cotter pin for each stud.

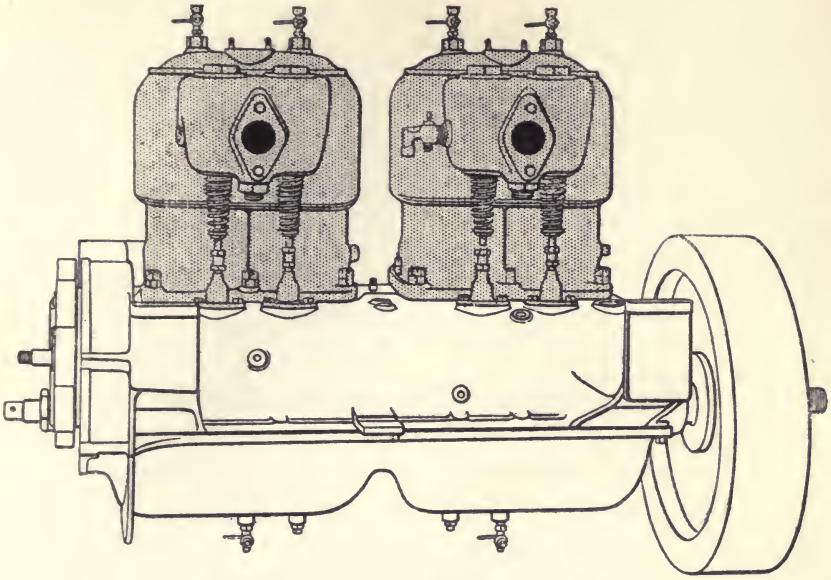
Pistons. Selected gray iron castings are used, each casting being subjected to a sand blast and a careful hand filing. This serves the purpose of a test, and also removes any partially loose metal and prevents it from working into the motor and cutting the bearings. The pistons are carefully turned on a lathe, and then ground



Building the Locomobile Motor, seventh view
Admission side with cylinders and valves added

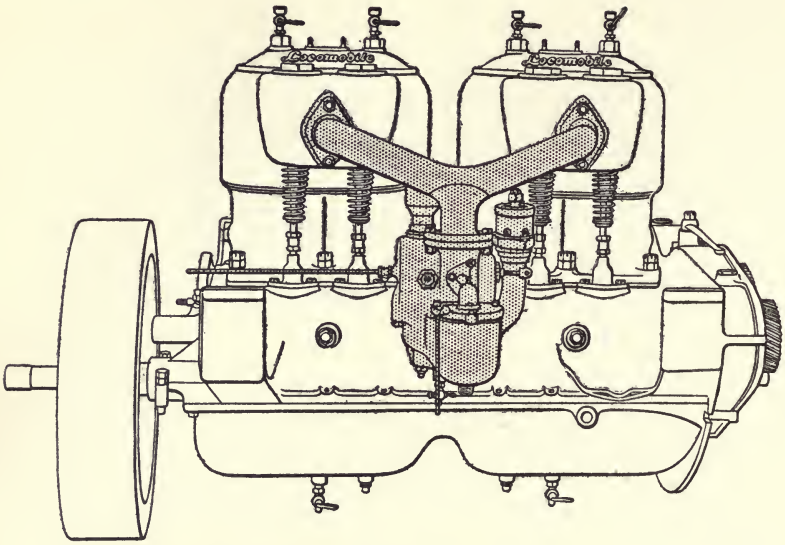
to exact size, the finished piston having a slight taper at the top to allow for expansion caused by the greater heat of the piston at its upper end. Piston rings are four in number, cut from specially selected, springy stock. The rings are turned eccentric, cut at an angle of 45 degrees, then compressed to circular form, held in a fixture, and ground all over their entire circumference. Pistons with rings in place are lapped with an abrasive compound until they fit perfectly.

Wrist Pins. Pistons are secured to the connecting rods by hardened steel wrist pins ground to size. The



Building the Locomobile Motor, eighth view
Exhaust side showing exhaust valves in place; also cylinder pet cocks

wrist pins are forced into the pistons with a very close fit preventing any up-and-down motion, and are secured to the pistons by steel studs, which keep them from turning or moving laterally. The studs are prevented from working loose by a steel wire, the ends of which pass through holes drilled in the ends of the studs, and are then bent around. The wrist pin bearing is a steel bushing, hardened and forced into the small end of the connecting rod and special provision for thorough lubrication of all wrist pins is provided.



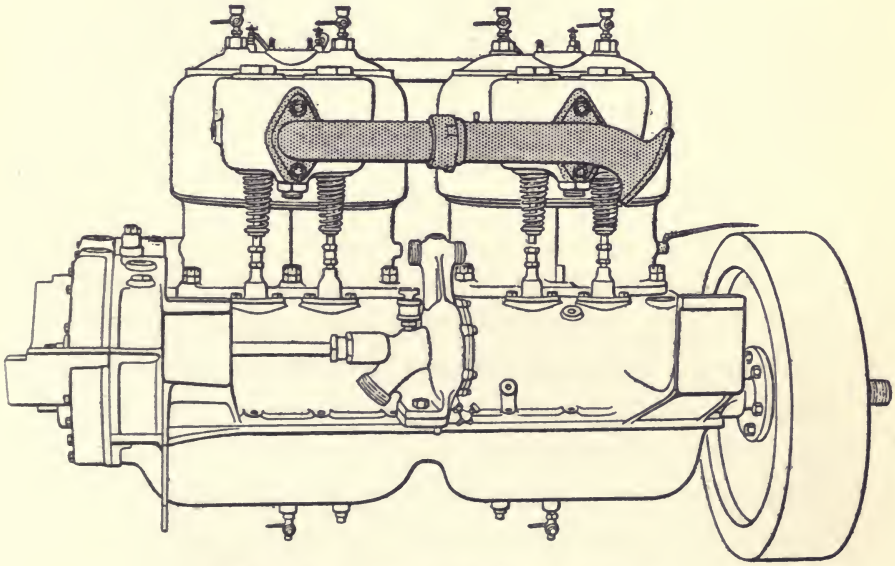
Building the Locomobile Motor, ninth view
Admission side. The carbureter with induction pipe is added

Cam-Shafts. These are Locomobile forgings and are finished throughout in our own plant. A feature is the forging of the cam-shaft with all cams integral; the ordinary practice being to make the shafts and then attach the cams. Locomobile cam-shaft construction eliminates unnecessary parts and does away with the chance of the cams becoming loose. Both admission and exhaust cam-shafts run in large bearings and are driven by gears located in a housing in the front of the motor.

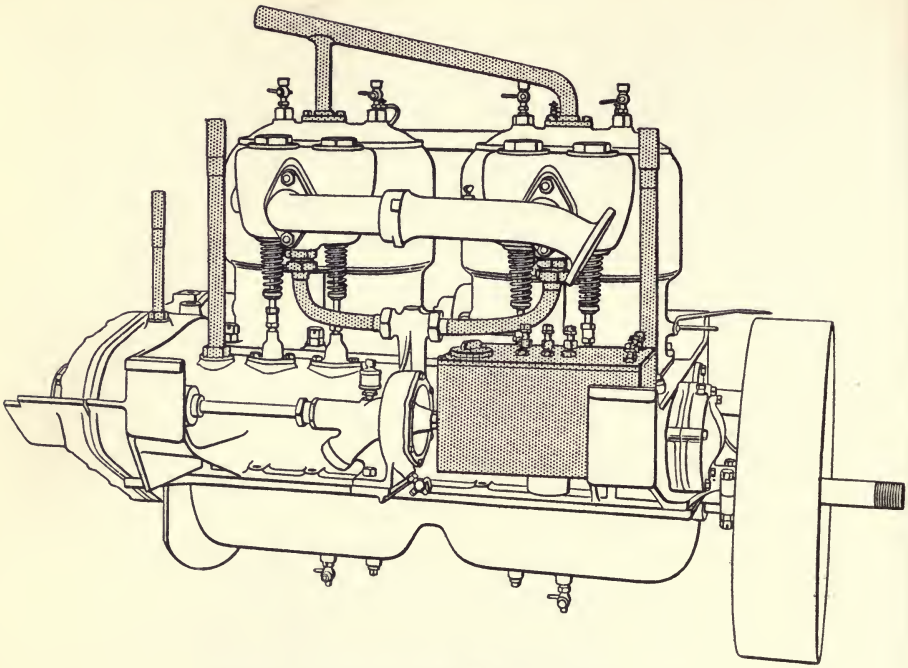
Valves. Of the mechanically operated variety, the admission valves interchanging with the exhaust valves.

Cam rollers are hardened steel and have a long bearing in the bronze lifter guides, a form of construction which prevents wear and rattle. The valve springs are of specially selected stock, the valves are carefully made and precisely set—the entire system of the Locomobile is such that it may be operated for long periods of time without need of attention. In case it is desired to check the timing of the valves, marks on the fly-wheel enables this to be done with promptness and certainty.

Pumps. The centrifugal water pump is located on the exhaust side of the motor. It is constructed



Building the Locomobile Motor, tenth view
Exhaust manifold is added ; also fly-wheel pointer for valve timing



Building the Locomobile Motor, eleventh view
Exhaust side complete with oiler, oil vent pipes and water piping

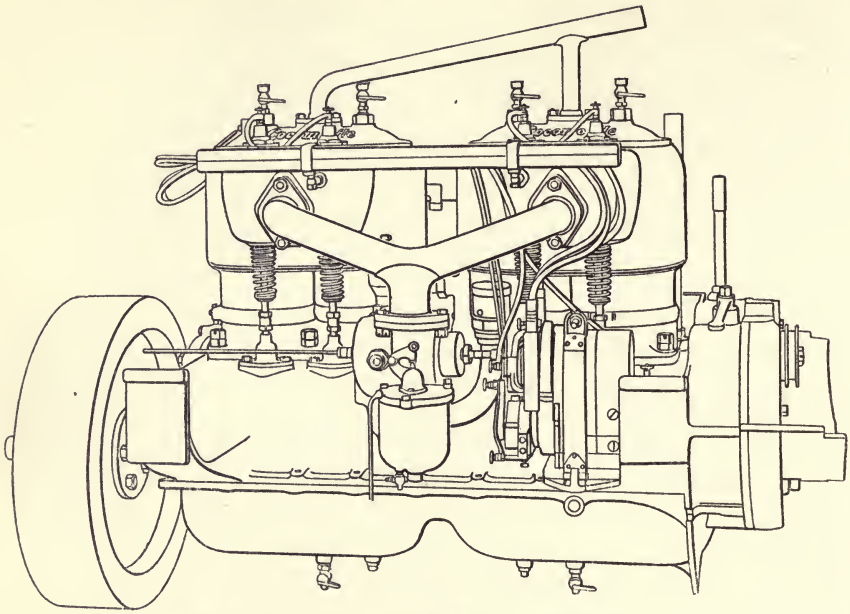
throughout of bronze, which is typical of Locomobile construction, and which prevents mis-alignment or breakage. The pump shaft is driven by a gear meshing with the exhaust cam-shaft gear located in the timing gear housing in the front of the motor.

Cylinders. Locomobile cylinders are cast in pairs with valve boxes and water jackets integral. The practice of casting cylinders in pairs is considered to be the best as it produces a compact motor and

does not limit the size or arrangement of motor bearings. A bronze cover plate is used for each pair of cylinders and carries the fittings for the water connections and the pet cocks. This form of construction greatly facilitates the production of perfect cylinder casting, and further enables the water jackets to be made uniform, and thoroughly cleaned out before the motor is built. This insures perfect cooling circulation. Every pair of cylinder castings are subjected to a very careful inspection, being subjected to a sand blast, hand filing, and finally to a cold water test. The cylinders are bored three times, and aged between cuts and are ground to exact size with water flowing through the water jackets to keep the temperature uniform and prevent distortion. Each pair of cylinders is secured to the bronze crank case by eight strong heavy studs, with double lock nuts and cotter pins. This absolutely prevents the cylinders from coming loose on the motor base.

Carbureter. Placed on the right, or admission side of the motor. The Locomobile carbureter is bronze, has very few parts, is the result of long experience, and as a result operates regularly and gives a satisfactory mixture at all times. The induction pipe between the carbureter and cylinders is bronze composition.

Fuel Tank and Fuel Feed. The Locomobile gasolene tank, like everything else about the car, is permanently



Building the Locomobile Motor, twelfth view
Admission side complete, with magneto, wiring and spark plugs

substantial. It is constructed of 24 gauge sheet steel, the strongest metal available for the purpose, and is heavily galvanized to prevent corrosion. The tank is braced internally with baffle plates, every joint and connection is reinforced; and every tank is tested with gasolene, upside down and in every possible position. The opening is under the seat cushion at the left of the car, provided with a removable strainer.

Gravity fuel feed is employed; superior to any pressure system on account of its greater simplicity,

reliability, and safety. The force of gravity always operates, whereas any pressure system is artificial, is more complicated and needs attention. An important advantage of the gravity system is that the tank is located under the front seat, where it is completely concealed and protected. The fuel tank is located at a sufficient elevation above the carbureter to insure a steady flow of gasolene at all times. The discharge pipe is located at the right and extreme rear end of the tank, so that the entire contents are available for use and the car may be operated until the last drop is gone. A large cone-shaped strainer is permanently placed over the outlet in the bottom of the tank to prevent impurities from passing to the carbureter.

Timing Gears. Placed at the front of the motor in a housing formed by an extension of the bronze engine bed, protected by an aluminum cover. The timing gears are of metal and cut in our shop, following our practice for the past eight years or more. Metal gears are absolutely unaffected by the action of oil; fibre gears or composition gears swell when immersed in oil and shrink when the car is not used; and, lastly, do not wear as long as metal gears. There are five gears in the case: crank-shaft gear, admission cam-shaft gear, exhaust cam-shaft gear, pump gear, and magneto gear. The separate gears are cut, and the complete train of gears assembled with the greatest possible care,

to produce silent running. The gears dipping into a bath of oil, lubrication is continuous and thorough.

Testing. We have tested every motor under its own power that we have ever built, and we have preserved a record of this test. This will serve as an example of our endeavor to make every motor as well and as thoroughly as possible. When the motor is completed by the assembling department, it is timed and then flooded with oil and placed on the stand where it is driven by a belt for a considerable period of time until it is somewhat limbered up. It is then placed on the test stand, and equipped with its own carbureter and magneto and ignition apparatus, and run under its own power, slowly at first, and then more rapidly. After it is broken in, its power is tested by engaging the fly-wheel with the armature shaft of a dynamo. As the motor drives the dynamo its mechanical power is transformed into electrical power, which is easily and exactly measured. Each motor is operated on the test stand until it fulfills the test.

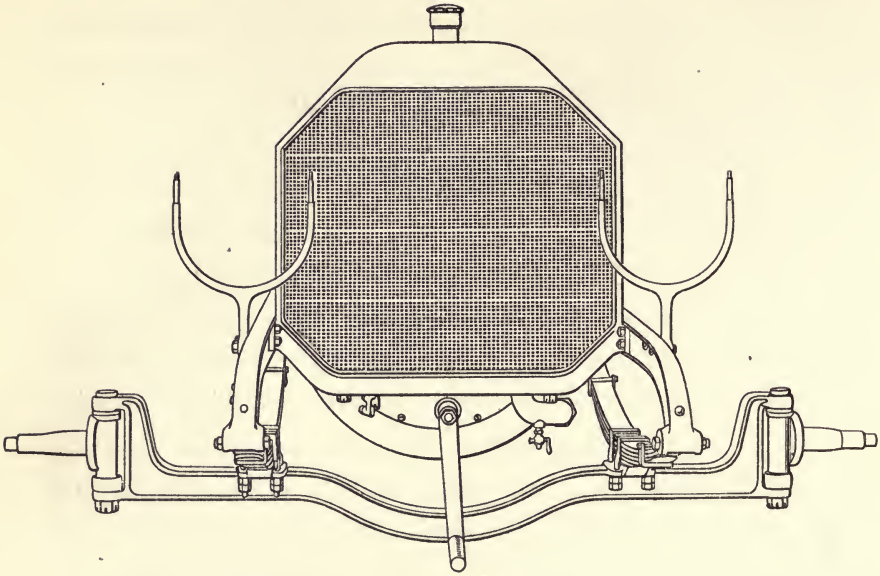
CHAPTER TEN

COOLING SYSTEM

The cooling system of any automobile is a very important part of it, and one that ought to be investigated carefully by the prospective purchaser. Nothing can be more disagreeable than to operate an inadequately cooled car in hilly country. In some sections of the country the cooling system of a car is of the greatest importance for everyday service, and cars which will not run for long periods of time on the first and second speeds without overheating are utterly impracticable. Further than this, nothing is more annoying than lack of reliability in the cooling system; a leaky radiator, leaky piping or a defective water pump are certainly matters to be avoided at any cost.

The Locomobile water-cooling system is exceedingly desirable because it is entirely adequate and perfectly reliable. The Locomobile motor is noted for its ability to run all day long in hilly country and in warm weather without overheating, and its ability to operate year after year without giving trouble.

The water jackets on Locomobile cylinders are carefully cleaned out before the motor is assembled, this operation being facilitated by the construction of



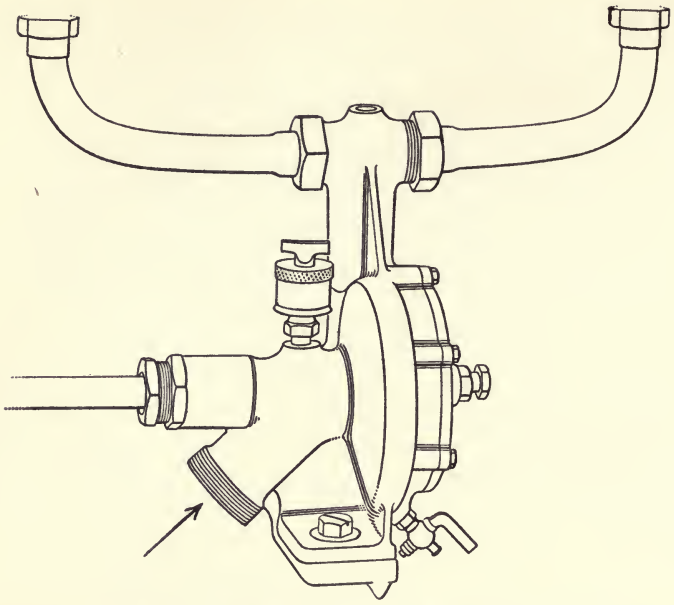
Type "L" Radiator and Front Axle

the castings. Each pair of cylinders is open at the top and provided with a cover plate. The cylinders and valves are completely water-jacketed and the circulation is ample and rapid, and produces a thoroughly satisfactory cooling of the cylinders.

The centrifugal pump is mounted on the exhaust side of the motor and is durably constructed of bronze, material which is used throughout the Locomobile in preference to aluminum wherever reliability is an important consideration and a small saving in weight exceedingly unimportant. The vanes of the pump

are mounted at the rear end of the steel pump shaft which is driven by a gear placed in the housing at the front end of the motor, and meshing with the exhaust cam-shaft gear. The base of the pump rests on a flat extension of the bronze motor base, and is secured to it by heavy screws, the piping leading to the cylinders also stiffening the construction and preventing the pump from moving or working loose. In case it should ever be desired to remove the pump, it can be very readily done as the pump shaft is made in two parts connected by a coupling. There is a long stuffing box where the pump shaft enters the pump, and lubrication at this point is provided for by a grease cup. A pet cock at the bottom of the pump allows water to be drawn off in the winter if desired.

The radiator is exceedingly neat and attractive in appearance and is placed slightly back of the front axle and secured to one of the cross members of the frame at the bottom only, so that there is no racking action on any of the joints, and thus no tendency to produce leaks, an exceedingly important feature. The Locomobile radiator is of the true honeycomb type, possessing the greatest efficiency; and the workmanship being of the best character obtainable, may be depended upon to give satisfactory service from year to year without leakage.



The Centrifugal Water Pump. Made of bronze

The centrifugal pump draws the cooling water from the base of the radiator and forces it up through the water jackets and out of the top of the motor into a copper pipe, thence back to the radiator through a heavy rubber hose connection, there being a union placed at the end near the radiator.

Back of the radiator is an eight-bladed aluminum fan which draws air in through the cells of the radiator, thus cooling the water flowing through it. The fan shaft runs on ball bearings which are packed

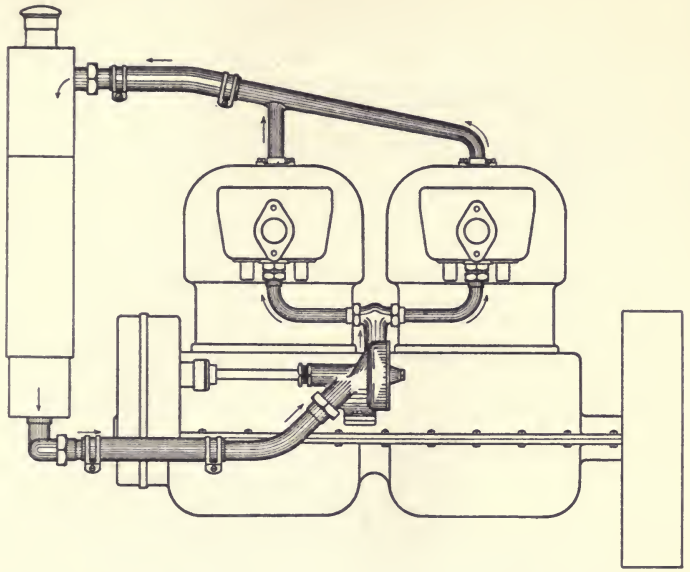


Diagram of cooling system "30" Locomobile. The arrows indicate the direction of the flow of water

in grease, which requires renewing only about once a year. The fan shaft is mounted on a bracket secured to the base of the motor. A leather belt drives the fan, one pulley being on the pump shaft, the other on the fan shaft with provision for convenient adjustment of the belt if necessary.

In the Locomobile cooling system every precaution is taken to insure satisfactory service without minor inconvenience; the piping is of the best quality, all joints and connections are made with great care, and

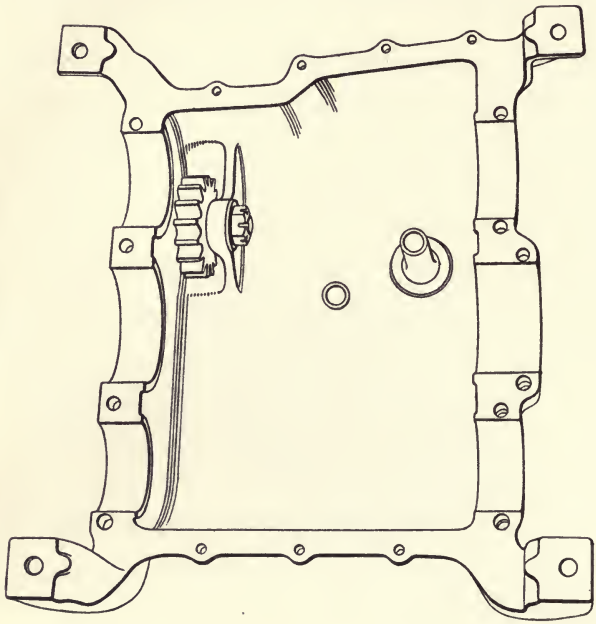
every radiator is thoroughly tested with cold water pressure before it is put on a car. An important part of the finished product is the water-cooling system and no car is approved until every detail in connection with it is entirely satisfactory.

CHAPTER ELEVEN

THE FOUR-SPEED TRANSMISSION

Advantages of the Four-Speed Selective Transmission. Early automobiles had two speeds, as a general rule. Later, three speeds were commonly employed, and today the high class car has, or should have, four speeds. A car provided with four speeds is more flexible than one with three speeds; the operator has more tools to work with, he can operate the car better under any road conditions at any particular time, the car is more easily accelerated and operated with less shock to the motor and transmission. The four-speed transmission is as much better than the three as the three is superior to the two-speed transmission. It occupies no more room, is no mor complicated, requires no more attention and no more lubrication.

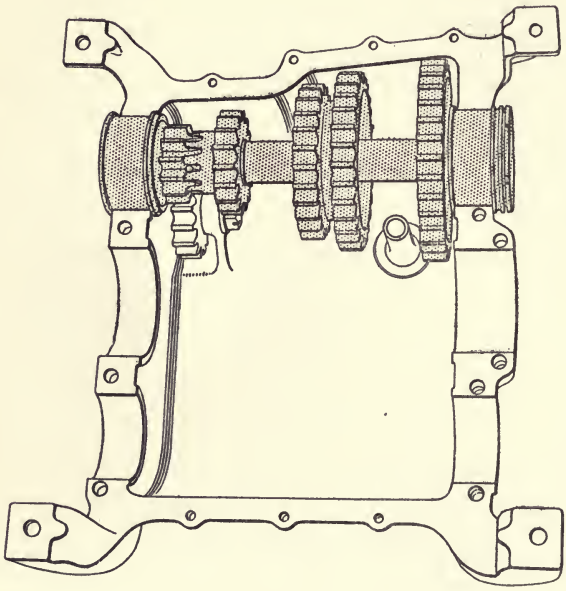
Generally speaking, there are three types of transmission gear: planetary, progressive sliding-gear system, and the selective sliding gear. The first system, the planetary, only lends itself well to two speeds, and is rarely, if ever, used nowadays except on cheap, small cars. The progressive system is used less than it used to be, and has given way, particularly in the high class cars, to the selective transmission. The



Building the Locomobile Transmission, first view. The bronze case
Note supporting points at four corners and reverse pinion at left ; also grease
stand pipe at right, regulating the depth of lubricant

selective system lends itself perfectly to the use of four speeds. The term "selective" means that the operator selects one of two sliding members to operate, certain speeds being obtained from one gear and different speeds from the other gear. For example, in the Locomobile the forward sliding gear gives third and fourth speeds, the rear sliding gear gives first and second speeds and reverse. The particular advantage of the selective transmission is its greater ease of operation; gears may be shifted easily, with absolute certainty and without the need of any complicated mechanism. There is a definite stop position for every position of the lever. Gear changing with the Locomobile is particularly easy as there are only two slots in the quadrant instead of three. The Locomobile transmission is simple, convenient and easy to operate; it is absolutely reliable and requires little or no maintenance.

Bronze Case. The transmission case consists of a single casting of manganese bronze, the strongest material that can be cast in light section and intricate form. The cover of the transmission is not subjected to any stress whatever, consequently is made of aluminum. Thus the transmission case is moderate in weight, vastly superior in strength. The absolute reliability of the Locomobile transmission is in a large measure due to the rigid character of the base, which prevents the gears and shafts from getting out of line.



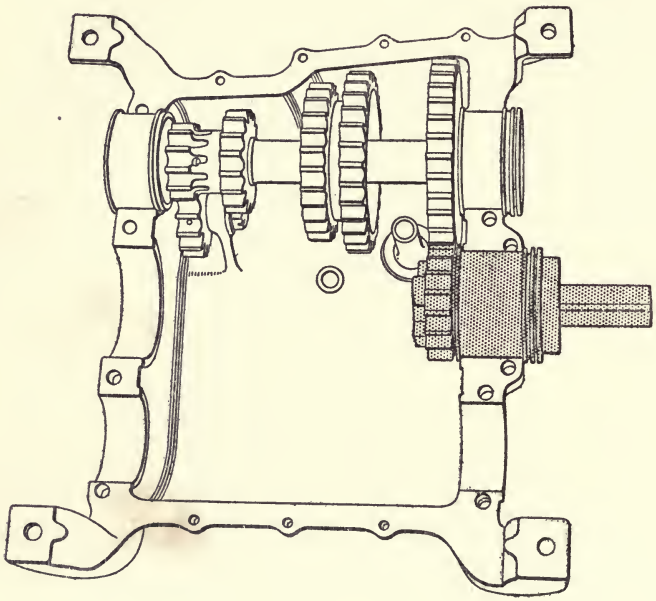
Building the Locomobile Transmission, second view
The ball bearing countershaft with gears assembled on it is first installed

Location. The Locomobile transmission is placed in the center of the chassis frame, where it is protected from road shock. The projections of the bronze base are extended up to meet the cross members of the frame and are securely bolted thereto. There are four points of support, one at each corner of the case.

Gears. There are ten gears in the transmission case. Each one is strictly a Locomobile product from beginning to end—from rough material to finished product. Material used is alloy steel, heat-treated. Gear teeth are cut on the best obtainable gear cutting machinery, are absolutely uniform, and absolutely correct as regards the shape of the teeth. Gears are carefully tested for hardness and elasticity, and are measured within .0001 of an inch.

Shafts. These are alloy steel, heat-treated. Particular attention is called to the fact that the case is compact and the shafts are large in size and relatively short. They combine to produce the greatest possible strength and prevent any mis-alignment due to bending. Locomobile transmission shafts are made in the Locomobile plant from raw material to finished product.

A Grease-Tight Case. Transmission gears, shafts and bearings are lubricated by soft grease. This grease is thrown about by the rotating shafts and gears, every wearing surface being constantly coated by the lubricant. The design of the case, and care used in assembling,



Building the Locomobile Transmission, third view

Clutch pinion with ball bearing is shown at the right, or front, of the case. It is always in mesh with the forward gear on the countershaft

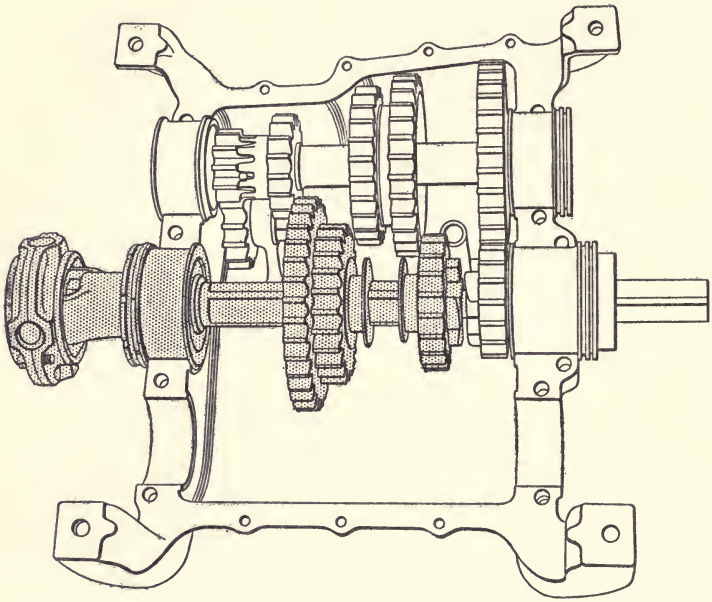
prevent leakage of grease, so that the car may be driven for several thousand miles without adding to the supply of grease.

Operation. A clear illustration of the Locomobile four-speed transmission is shown on page 196. At the left is the universal joint, located to the rear of the gear box. When the lever is in the outer slot of the quadrant and pushed as far forward as it will go, with button on top depressed, reverse speed is engaged. This action of the gear lever causes the rear sliding member to move backward until the large portion of it meshes with the idle pinion at the bottom and rear of the case.

When the gear lever is in the outer slot of the quadrant and pushed as far forward as it will go without touching the button on top, the large gear of the rear sliding member meshes with the rear gear on the countershaft, and this gives first speed.

The gear lever now being pulled back to rear position in the outer quadrant, the sliding member moves forward until the small gear meshes with the third gear on the countershaft, and this gives second speed.

The lever is now pulled through the gate and pushed forward as far as it will go, this causing the front sliding member to move backward until the gear meshes with the second gear on the countershaft. This gives third speed.

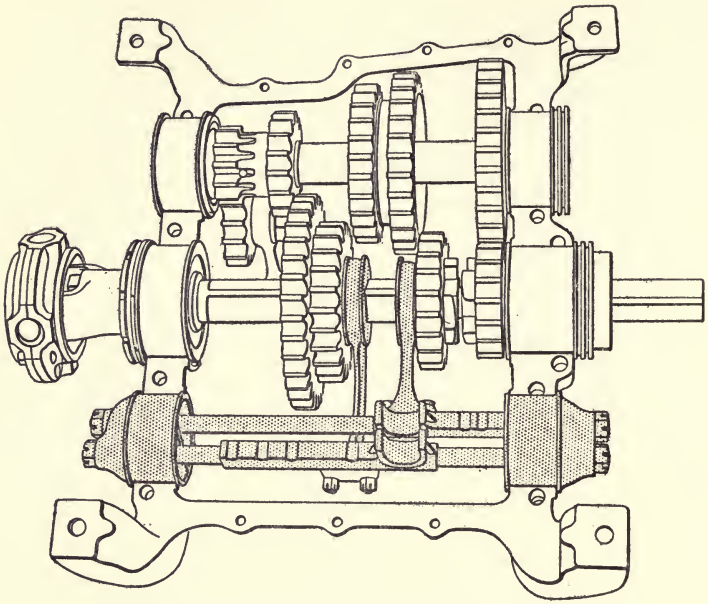


Building the Locomobile Transmission, fourth view

The square main driving shaft with two sliding members is shown. Note universal joint at rear of case. In actual assembly, the square shaft and clutch pinion are installed as a unit

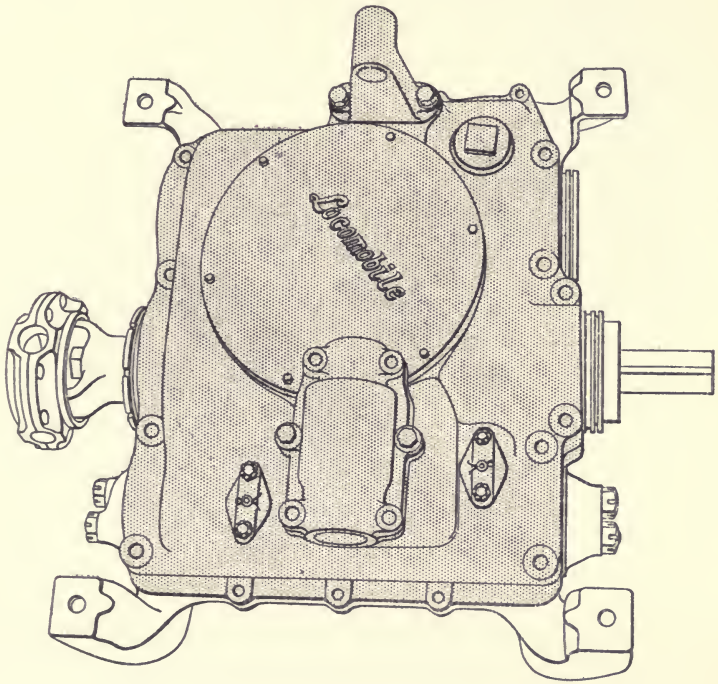
When the gear lever is pushed back as far as it will go in the inner slot, the forward sliding member moves ahead until the jaw clutch integral with it locks with a corresponding jaw clutch integral with the clutch pinion. This gives fourth speed. The clutch pinion is always in mesh with the first gear on the countershaft.

Testing. A very interesting feature of Locomobile transmission construction is the testing of each and every transmission. This is accomplished by means of the special apparatus described in an earlier chapter.



Building the Locomobile Transmission, fifth view

The addition of the necessary mechanism to move the sliding gears completes the contents of the case. There are two forks that engage with the two sliding gears on the squared shaft, and operated by a lever connected with the hand-gear lever. When the gear lever is placed in the outer slot and moved backward and forward, the three different positions that give reverse, first, and second speeds, correspond with definite positions of the rear sliding member and fixed by a plunger on the outer fork shaft. When the gear lever is moved from the outer slot to the inner one, the lever that shifts the forks moves from one to the other. The two positions that give third and fourth speeds on the inner slot correspond with definite positions of the sliding gear and are established by a plunger on the inner fork shaft.



Building the Locomobile Transmission, sixth view

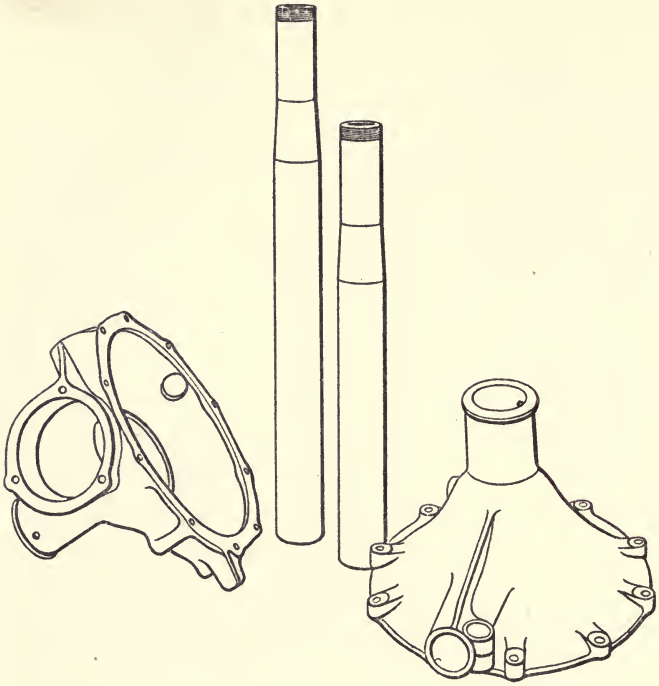
The aluminum cover plate is placed in position. Note circular plate ; also grease plug at upper right hand corner

CHAPTER TWELVE

REAR AXLE AND SHAFT-DRIVE SYSTEM

The shaft system of final drive is now in almost general use because it is quiet in operation and requires little attention in the way of lubrication and maintenance. The importance of examining the shaft-drive construction of a car before purchasing is shown by the wide difference in design which exists today. There is probably more difference in shaft-drive design than there is in engine design. For 1911 we are building shaft-drive exclusively and are able to offer the same reliability obtained by the use of our former chain-drive cars. This we believe has been abundantly proven by the performance of our shaft-drive models in 1909 and 1910. We believe that the Locomobile shaft-drive system contains more features that go to make up perfection than any other shaft-drive car. Some of these features are:

1. Great strength with light weight. All weight below the springs and not supported by them is dead load, and the greater the amount of this, the harder the car will ride. We use alloy steel in our rear axle tubes, the strongest steel there is, enabling us to produce a light axle and thus an easy riding car.



Building up the Locomobile Shaft-Drive System, first view
The rear axle consists of four parts, the two-part central housing and axle tubes

2. We remove all torsional stress from the rear axle, which makes for easy riding and increased reliability.

3. There is no brazing in the rear axle construction.

4. There are no keyways or keys.

5. Every stress is properly taken care of and there is no friction or cramping.

6. We do not drive through the springs but through distance rods, as in chain-drive construction.

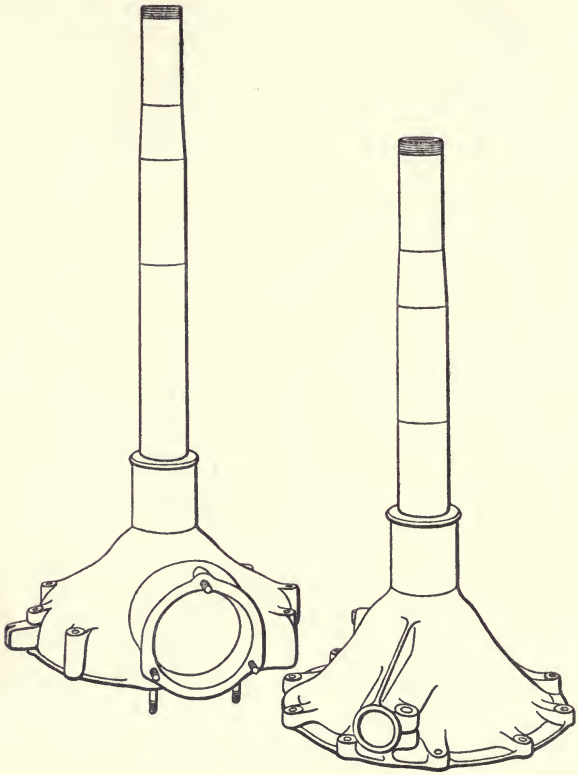
7. Large gears, shafts, and imported annular bearings, reducing wear and eliminating breakage.

8. Free action of differential when turning corners, reducing wear on tires.

Rear Axle Tubes and Housing. The rear axle consists of a built-up design, with central housing containing the bevel gears and differential, lateral tubes carrying the load and containing the rotating live axles which transmit power to the wheels. The central housing consists of two steel castings, strongly ribbed and bolted together with twelve heavy bolts.

The steel tubes are forced into the opening in the end of each section of the housing by hydraulic pressure. The housing is placed in a hydraulic press and the tube is forced into the opening of the outer end, the amount of pressure ranging from 18,000 to 22,000 pounds to the square inch. Great care is taken to prevent excessive pressure as this might exceed the elastic limit of the housing.

A great advantage in this form of construction is that *it eliminates brazing*. A brazed joint is undesirable because its strength is unknown. It may be very strong, it may have little or no strength. In the Locomobile rear axle there is no brazing from end to end. So far as we know, this is true of no other car. It is



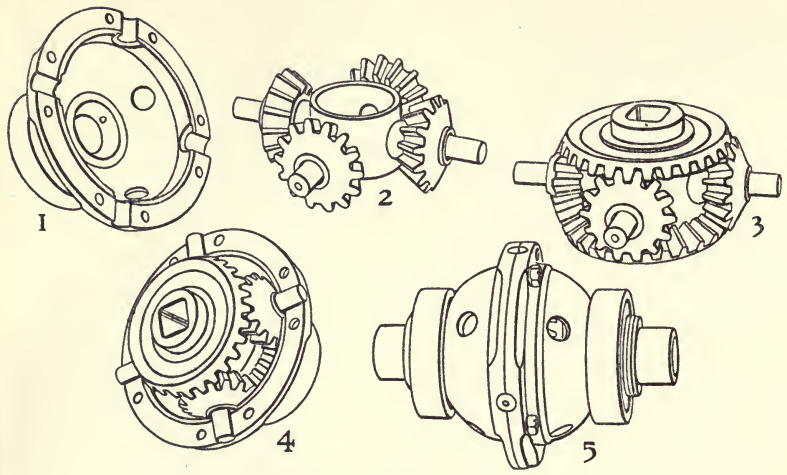
Building up the Locomobile Shaft-Drive System, second view
The axle tubes have been forced into the ends of the housing and riveted into place

impossible to braze alloy steel, consequently other makers cannot use alloy steel in their rear axle tubes. It is evident that this combination of alloy steel without brazing is a very strong advantage of our car.

The tubes are of large diameter at their inner ends to give great strength. It is necessary to reduce this diameter at the outer ends, but it is accomplished by a gradual taper instead of a shoulder. This arrangement prevents any concentration of stress, permits the use of a tube of uniform wall thickness, with maximum strength and minimum weight.

Contents of Central Housing. The power of the motor is transmitted through the propeller shaft to the pinion gear at its rear end. The pinion gear located in the forward extension of the central housing is supported with the greatest care and runs on large imported ball bearings. A thrust bearing is provided to take the thrust of this pinion. The driving pinion meshes with a large bevel driving gear which is substantially bolted to the case containing the differential, the power thus passing through the differential case to the differential pinion gears.

Differential. The Locomobile differential is so designed that the members are very large in size for the work they have to do and are constructed of the finest materials — consequently there is never any breakage and the wear is the minimum. The construction of the differential permits a rigid housing and shaft for the installation of the driving gear. The firmness with which the small pinion of the differential is supported, is an important feature. Under no



The Locomobile Differential and Compensating Gear

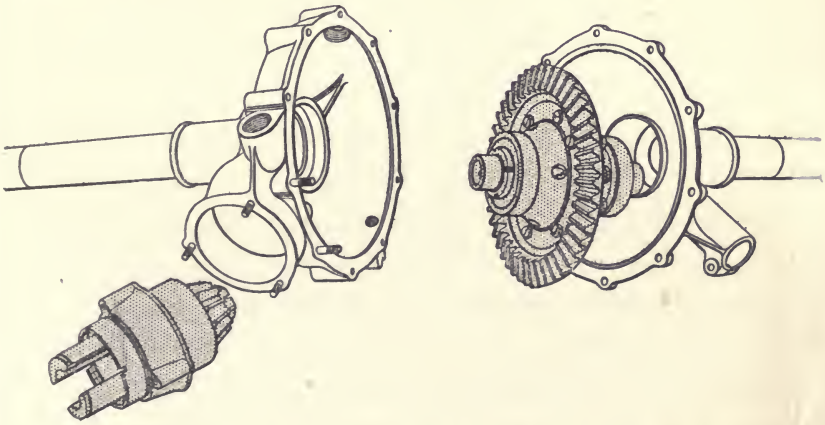
1. One half of case. 2. Pinion gears mounted. 3. Bevel and pinion gears assembled. 4. One half of case with gears. 5. Case complete with ball bearings

circumstances will the differential cramp when the car is turning a sharp corner — this freeness of operation is an essential point in connection with the wear on tires.

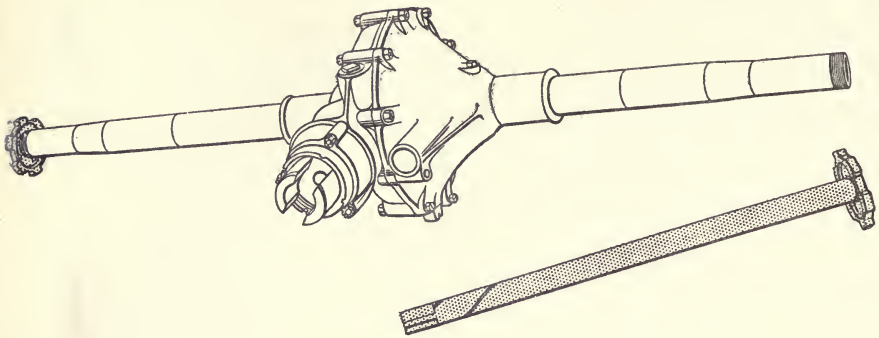
The differential pinions mesh with the bevels, the power passing from the latter to the live axles. The inner ends of the live axles are squared and fit in the square holes in the bevel gears of the differential. Their outer ends are in the form of jaw clutches which connect with similar jaw clutches in the hub of the wheel. These clutches are integral with the live

axles, a light, strong construction. The live axles are removable by simply unscrewing the hub caps and withdrawing them from the tubes. The hub caps on the wheels are merely dust covers and are no part of the shaft-drive system, and have no tendency to unscrew and fall off.

Truss Rods. Tension members pass underneath the bottom of the housing to prevent the stresses from being centered. This enables us to use a lighter axle than we ordinarily could. Locomobile truss rods are anchored at their outer ends and meet in a turnbuckle, which provides for adjustment should this ever be necessary.



Building up the Locomobile Shaft-Drive System, third view
Shows the driving pinion at left, with large annular bearing and slip universal joint; also the driving bevel gear at right, with differential, all contained in the central housing



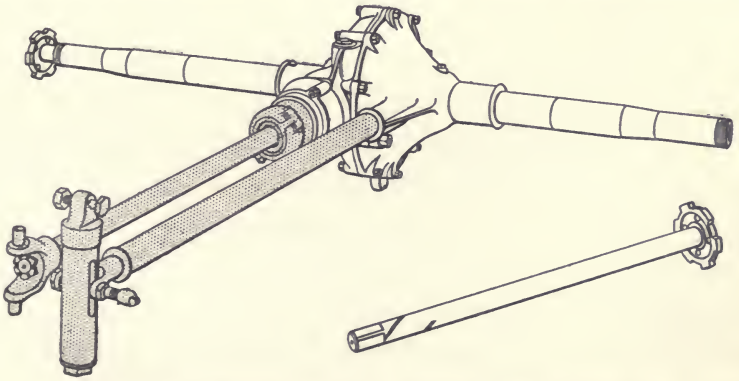
Building up the Locomobile Shaft-Drive System, fourth view

Shows the rear axle assembled ; also shows one of the live axles inserted in the axle tube at the left, the other withdrawn

Spring Chairs. The rear springs are mounted on spring seats or chairs, fitted to the rear axle and provided with a bearing. Consequently any tendency which would cause the spring chair to twist the rear axle is removed. The spring chair bearings on the rear axle consist of bronze bushings with endless grooves, and adequately lubricated by grease cups. The bottom portion of the spring chair is formed with a projection extending downward vertically, which forms a lifting point for the jack. This is a very convenient arrangement, as the renewal or displacement of tires makes it necessary to jack up the rear axle under the most unexpected conditions.

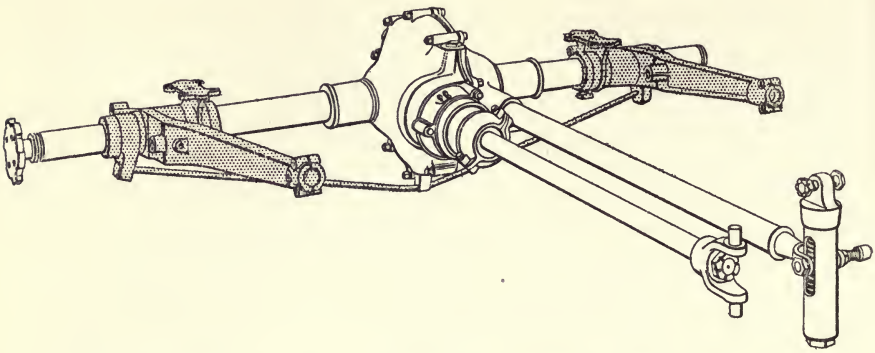
Distance Rods. Power is transmitted through distance rods exactly as in the best double side chain-drive. Each distance rod has a lubricated bearing on the rear axle consisting of a bronze bushing working against the alloy steel of the rear axle, the bushing being provided with endless grooves, and lubricated by a grease cup. The front end of the distance rod resembles a universal joint as it is so arranged that complete provision is made for any stresses which tend to twist it or bend it. The bearings that admit compensation for these stresses consist of hardened steel pins and bronze bushings with complete grease cup lubrication.

Live Rear Axles. These transmit the power from the differential to the wheels, their inner ends having a



Building up the Locomobile Shaft-Drive System, fifth view

The propeller shaft is installed with universal joints at both ends, also the torsion rod at the right of it, with spring-supported front end



Building up the Locomobile Shaft-Drive System, sixth view

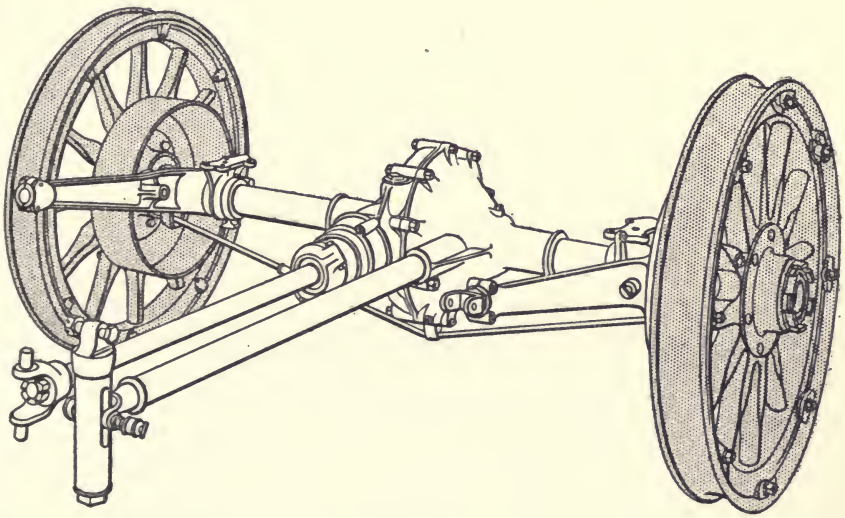
The distance rods have been added with lubricated bearings on rear axle tubes; also the spring chairs with lubricated bearings on rear axle; also truss rod

square fit in the differential bevel gears. The inner ends of the live axles are fully supported in the differential housing and run on bearings of liberal dimensions. There is also contained in the central housing a thrust ball bearing for the bevel driving gear.

Propeller Shaft and Universal Joints. The Locomobile propeller shaft is constructed of alloy steel, heat-treated — a Locomobile product from beginning to end. It is practically horizontal when the car is loaded, this giving a straight line drive. The shaft is fitted with two full universal joints, one at each end, which compensate for all stresses tending to cause any cramping or binding action. Many cars have but one universal joint; few, if any, have the combination of a

horizontal driving shaft with a universal joint at each end and locked in place under all conditions.

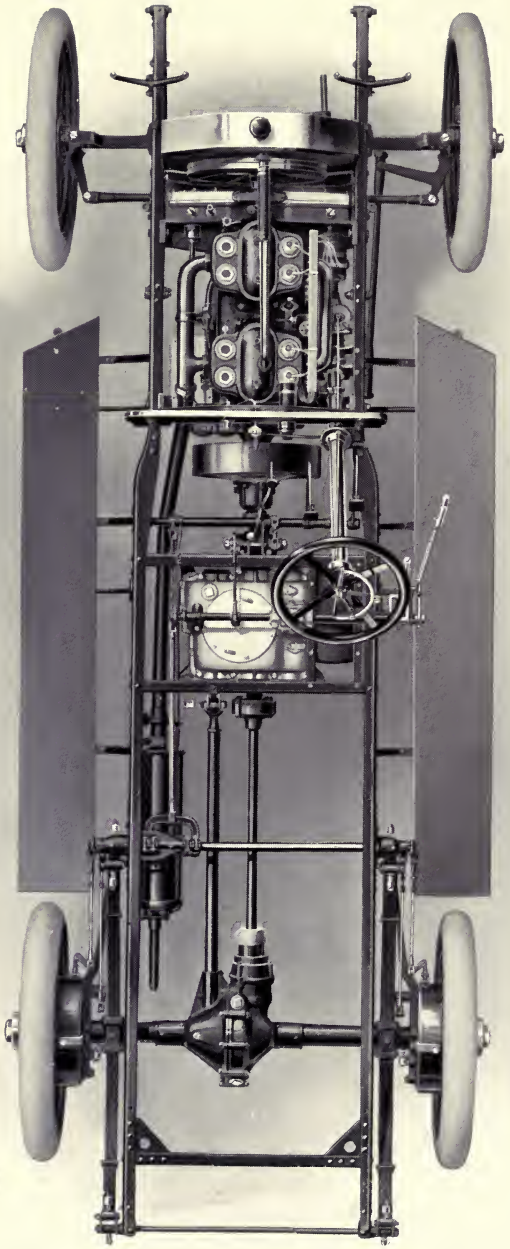
The forward universal joint is of the yoke pattern, giving motions in two directions at right angles. It is encased in a metal housing packed with grease. The universal joint at the rear of the propeller shaft is a slip universal joint, and provides compensation for any tendency to cause a change in the distance between the center of the rear axle and the transmission.



Building up the Locomobile Shaft-Drive System, seventh view

The wheels have been added. Note notches on right hand wheel hub. These engage with similar ones on outer end of live axle

Torsion Rod. In some cars the torsion rod consists of a tube covering the propeller shaft, but with this style of construction only one universal joint is possible, with the result that the stresses are not taken care of satisfactorily. In the Locomobile the torsion rod is rigidly mounted on the rear housing, the front end being spring supported to a cross member of the frame. The torsion rod transmits the torque reaction between the body and the road without affecting the action of the springs, and reduces the tendency to raise the body when the car is started.



Plan View of the "30" Chassis, Type "L", Four-Cylinder

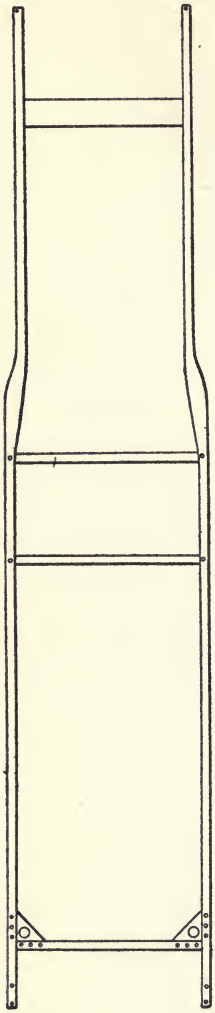
CHAPTER THIRTEEN

CHASSIS CONSTRUCTION

Chassis Frame. This is an exceedingly important component of a car, and the Locomobile frame is characterized by its great strength. The material used is pressed alloy steel, heat-treated; vastly superior in stiffness and durability to a frame constructed of cold rolled steel, or other low-priced steel. The long, parallel side members are narrowed in front, enabling the operator to twist the front wheels at a sharp angle and to turn the car in a small circle; at the point where the side members are narrowed, the horizontal flanges are increased in area to secure additional stiffness against side stresses.

Cross members of pressed steel brace the frame, all rivet holes being drilled instead of punched, all rivets being put in hot, and each one tested. Corners at the rear are braced with triangular gusset plates. The Locomobile frames are of the drop variety, whereby the center of gravity is lowered and the general effect of the car improved without any reduction in clearance.

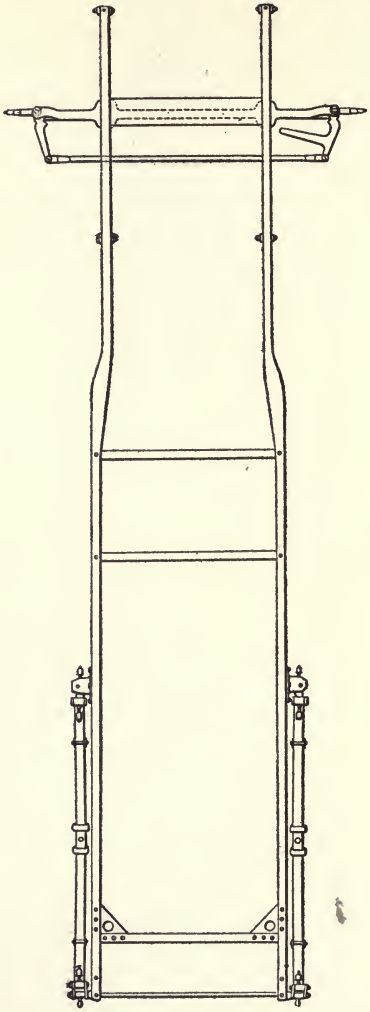
The Type "L" frame is dropped 2½ inches, the Type "M" frame 4 inches.



Building up the Locomobile Chassis

First view

Pressed steel frame that is a foundation for the motor transmission and other mechanism. Bird's-eye view.



Building up the Locomobile Chassis

Second view

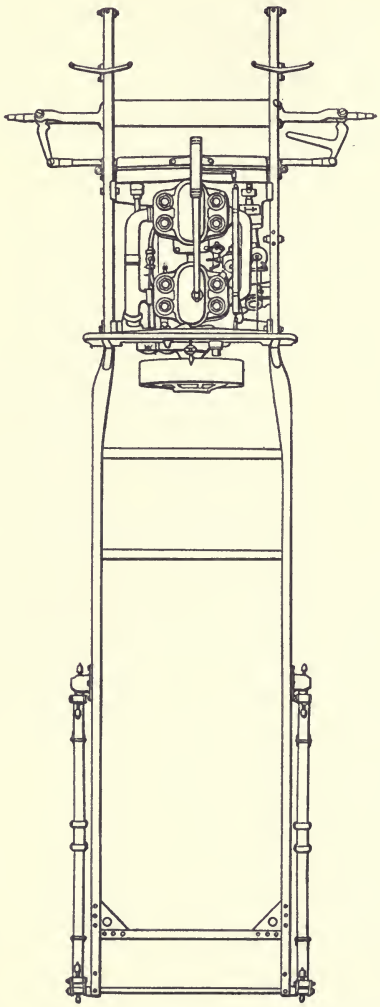
The front axle, front and rear springs have been installed, also the headlight brackets and rear spring hanger tube.

Springs. The front ends of the front springs are bolted to the spring horns of the chassis frame and are shackled to the frame at their rear ends. Lubrication is accomplished by grease cups. The spring eyes are fitted with steel bushings to prevent wear.

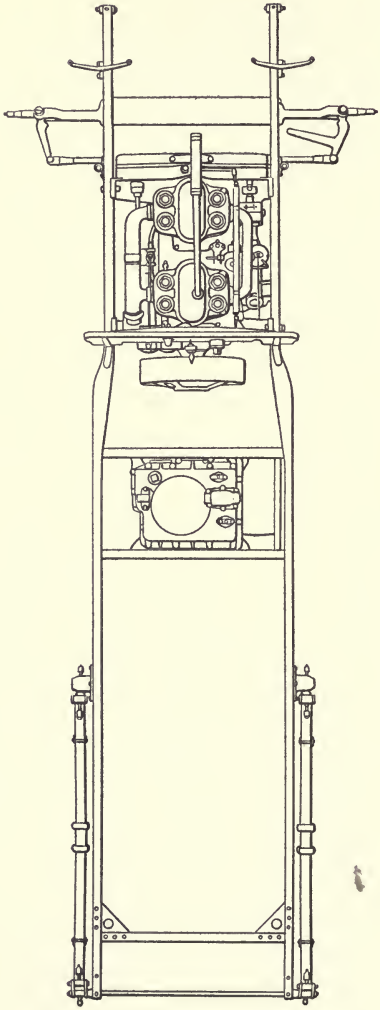
All Locomobile springs, both front and rear, are tongued and grooved to prevent side motion and are polished and assembled with graphite to insure free action and prevent wear. Spring leaf retainers are also employed, both front and rear, these being clipped around the four top leaves of each spring on each side of the axle. There are seven leaves in the front springs.

Front Axle. The front axle is a massive Locomobile drop forging, heat-treated. It is secured to the front springs on each side by two heavy drop forged spring clips of nickel steel. Any side motion is prevented by a vertical dowel pin, part of which is in the axle and part in the spring. The spring clip bolts pass through horizontal flanges in the axle and are secured by a nut and lock nut, the end of the bolt being headed over to prevent any possibility of the ends working lose. The front axle is assembled to the frame with steering pivots and cross-tie rod complete. All wearing parts are lubricated by grease cups.

The next process of assembling is to secure the rear springs to the chassis frame. A heavy steel bracket bolted to the frame by five strong bolts carries the front



Building up the Locomobile Chassis
Third view
The motor with fly-wheel has been placed in position, also the dashboard

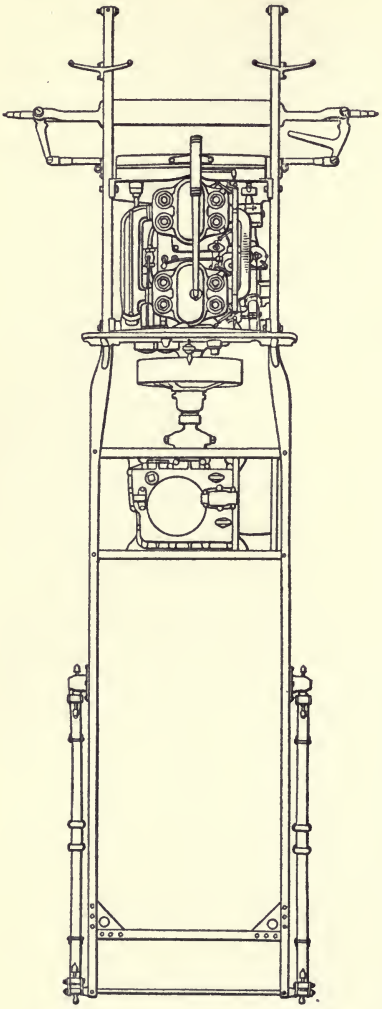


Bullding up the Locomobile Chassis
Fourth view
Transmission case has been secured to the frame near the center

end of the rear springs, the shackle bolt passing through the rear of this bracket. The rear springs are shackled at both ends. In the "L" car the springs are semi-elliptic, whereas in the larger Type "M" model, the rear springs are of the three-quarter elliptic variety. There are ten leaves in the rear springs, the weight of which varies with the load to be carried, the springs being heavier for limousine bodies. The rear springs are secured by two nickel steel clips to a spring chair which fits over the rear axle tube and has a lubricated bearing thereon, bronze against alloy steel, and each bearing is adequately lubricated by a grease cup. Both front and rear shackle bolts are lubricated by a grease cup.

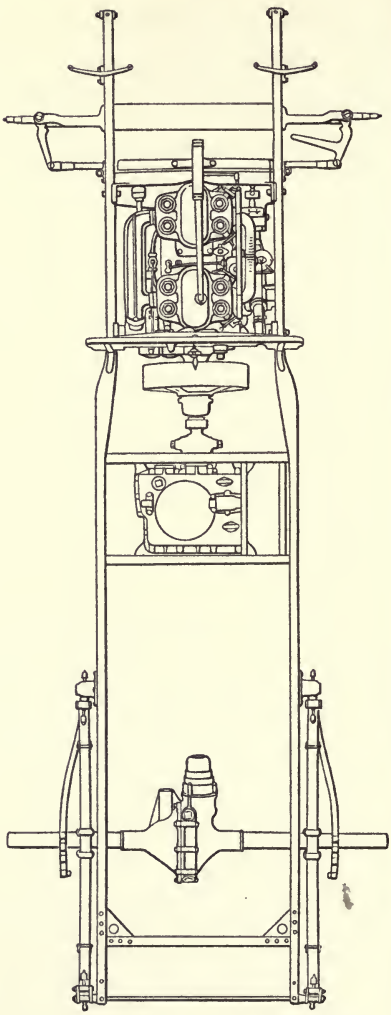
Motor. Lateral arms of the bronze crank case extend to the side members of the frame and are securely bolted thereto. These side members are so shaped that the upper portions rest on the top flanges of the frame, thus making a very substantial construction, and a very simple one. It is interesting to note that in the Locomobile all holes drilled through the pressed steel frame are jig drilled, so that any motor will fit any frame. This is also true of the assembly of the transmission, springs and other parts of the frame.

Transmission. The manganese bronze transmission case of the Locomobile is provided with arms at the four corners which extend upward and are securely



Building up the Locomobile Chassis
Fifth view

The clutch and clutch rocker case have been assembled between the fly-wheel and the transmission.



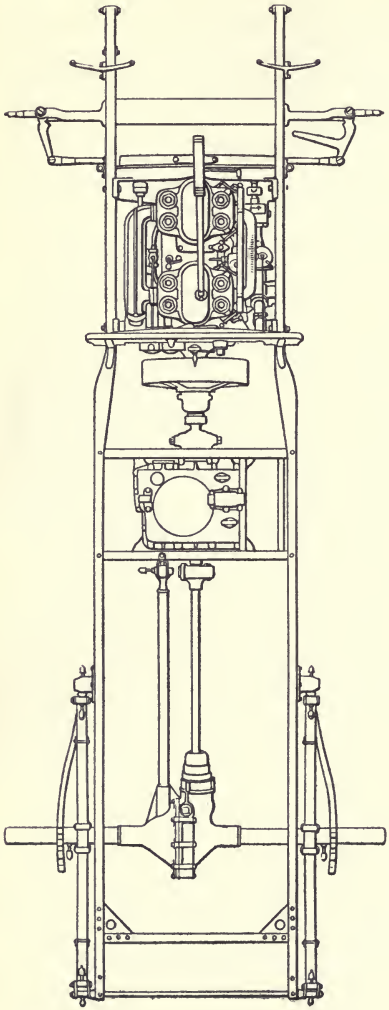
Building up the Locomobile Chassis
Sixth view

The rear axle is added, the distance rods are shown curving outside the rear springs.

bolted to cross members of the frame, double lock nuts and cotter pins being used to secure permanent connections. After the motor and transmission case have been installed, the clutch and driving shaft are located and very carefully aligned so that the power exerted by the motor is transmitted to the propeller shaft without frictional loss due to inaccurate fitting.

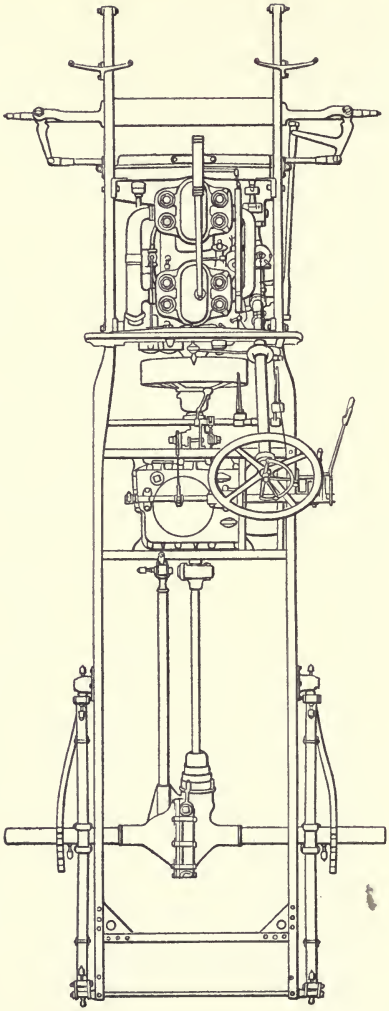
Rear Axle. Next the rear axle, with central housing containing bevel gears and differential, is put in place, this being accomplished by breaking the spring shackle connections and slipping the axle underneath the frame and then slipping the spring chair bearings through the ends of the axle tubes. Distance rods, which establish and maintain the position of the rear axle with respect to the frame, are next installed. The propeller shaft is then connected with the front universal joint which is placed just back of the gear box, and is connected at its rear end with a slip universal joint at the forward end of the rear axle housing. The assembling of this part of the car is completed by the installation of the torsion rod, which is made fast to the rear axle housing at its rear end, the front end being spring supported to a cross member of the chassis frame.

Levers and Pedals. The various levers and pedals with their shafts and fittings are very carefully put in place and lined up, thus making brakes, clutch, and



Building up the Locomobile Chassis
Seventh view

Propeller shaft and torsion rod have been installed between the transmission and rear axle.



Building up the Locomobile Chassis
Eighth view

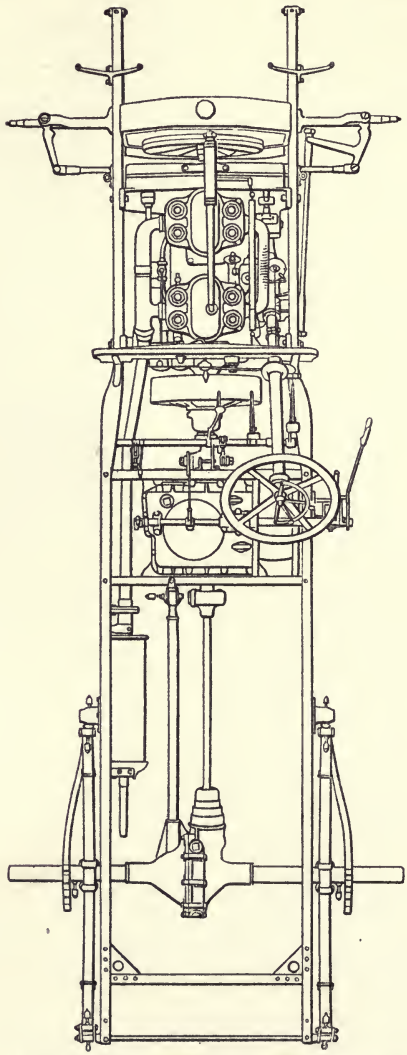
The steering gear, pedals and hand levers have been added

transmission gears operative. The details of assembly in connection with these various parts is done very substantially and accurately for the reason that they are all very important and essential to the safe operation of the car.

Steering Mechanism. Next the Locomobile steering column, with wheel, is mounted on the frame, the lower portion of which consists of a two-part housing of manganese bronze containing the steering gears, and which is bolted to the side member of the frame at sides, top, and bottom. The steering connecting rod is now assembled with right-hand steering knuckle at the front, and steering tail shaft at the rear, thus making the steering mechanism operative.

Radiator. At the front end of the frame there is a pressed steel cross member in the form of a cradle, which supports the honeycomb radiator. At the base of the radiator are four large studs, which pass through holes in the pressed steel cradle, and are securely bolted to it. By this method of fastening there is no racking action on the radiator, consequently no tendency to produce leaking, a point which is of considerable importance. The bearing for the starting crank is a bronze bracket riveted to the underside of the radiator cradle.

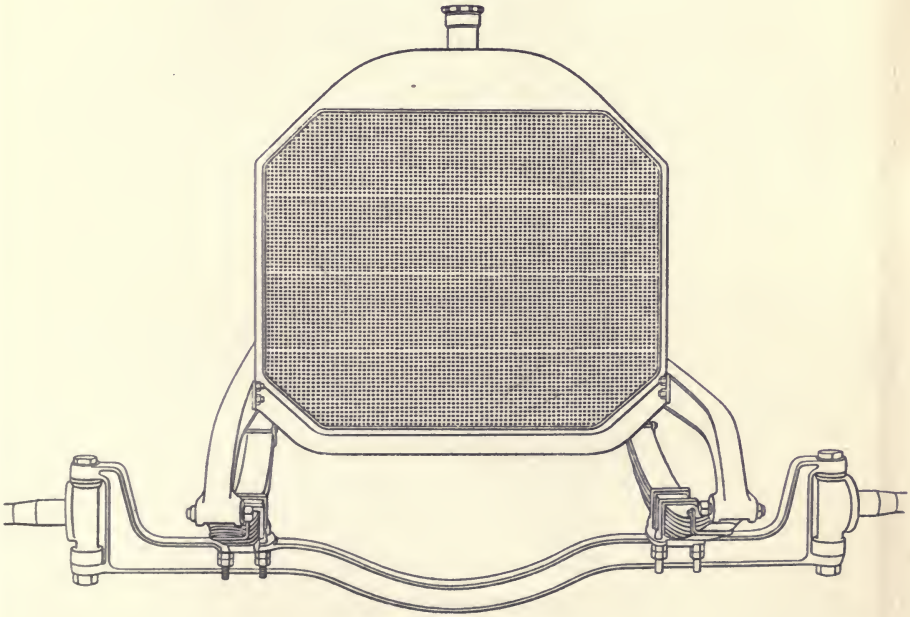
Muffler and Exhaust Pipe. The muffler is a metal cylinder with internal departments through which the



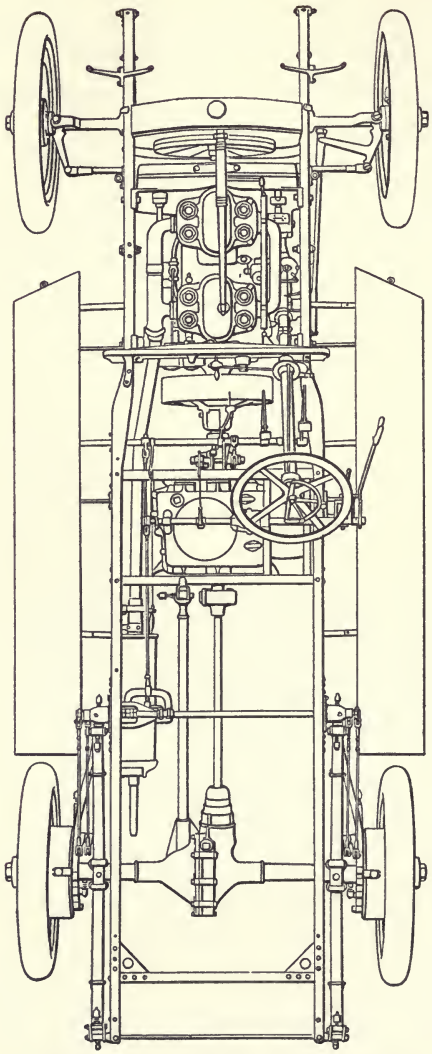
Building up the Locomobile Chassis, ninth view
Exhaust pipe and muffler are next connected, also radiator

exhaust gases pass until they leave it at the rear, the sound being deadened. The muffler is bolted to the frame at the end of the car near the rear, and after this the long exhaust pipe and exhaust manifold are connected.

Running Board and Fenders. The running boards are wide and substantially built, being mounted on heavy Locomobile drop forged brackets. The running boards are covered with heavy cork matting and durably bound in brass.



Type "M" Radiator and Front Axle

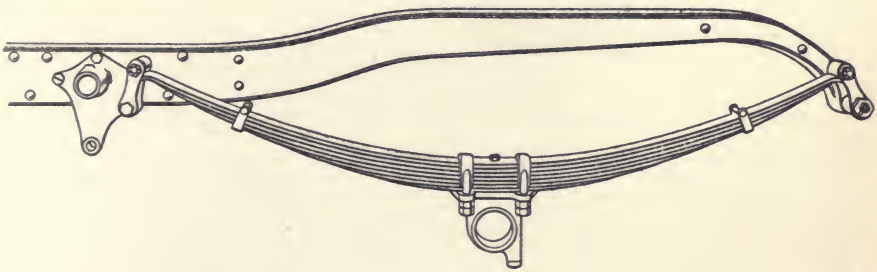


Building up the Locomobile Chassis, tenth view

The chassis is shown complete with wheels, running boards, brake shaft, but without bonnet or fenders

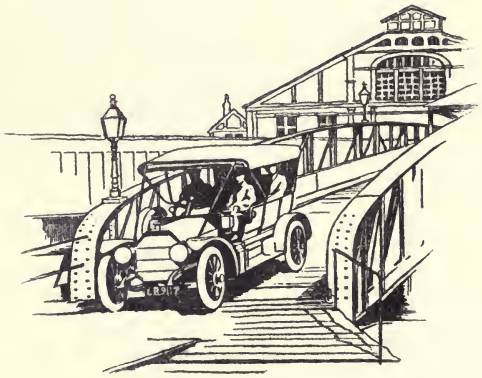
Locomobile fenders are designed for efficiency, durability, and graceful appearance. Both front and rear fenders are constructed of sheet metal, braced by Locomobile drop forgings, and mounted on Locomobile drop forged steel brackets. Fenders are provided with inner wings or shields to prevent any mud or water being splashed between the wheels and bonnet. The fenders are strongly constructed to prevent deformation, rattling, loosening, or breakage, and are enameled to produce the most durable finish. The design is such that the fenders afford the maximum protection.

Wheels. The completion of the chassis is arrived at by putting on the wheels (front and rear) and mud pan; which protects the clutch and other mechanism from mud and water. It is to be noted that the front wheels run on roller bearings which are well adapted



Rear Spring, "30" Locomobile, showing spring chair with bearing and lifting point for jack

for the purpose at this point because of the fact that they are designed to take care of the end thrust which occurs in turning corners, in addition to the ordinary radial load. The rear wheels run on imported annular bearings. There are, of course, two bearings, inner and outer, for each of the four wheels.

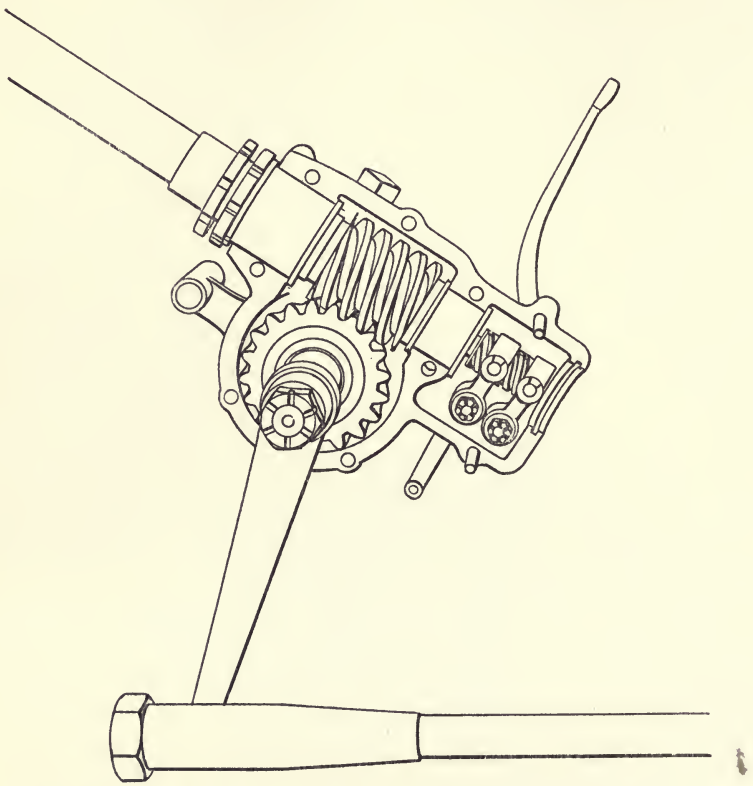


CHAPTER FOURTEEN

THE CONTROL OF THE CAR

Steering Wheel. Most cars use an aluminum steering wheel with a wooden grip. The superior strength of the Locomobile wheel is evinced by the fact that it is constructed of bronze, with a black, hard rubber grip moulded around the rim. Cases have been known where the steering wheel has broken in the hands of the operator at a critical moment; the Locomobile bronze construction renders this impossible. A laminated wood grip cracks and opens up through constant handling and the action of the weather, whereas the Locomobile hard rubber grip is permanent.

Throttle and Spark Advance. On the top of the steering wheel is mounted the quadrant carrying the hand levers stamped, "Gas" and "Spark" respectively. When the gas lever is moved toward the top of the wheel, the supply of gas delivered to the motor is increased, and when it is pulled back as far as it will go just enough gas is admitted to keep the motor turning over at slow speed. The spark advance lever is pulled back as far as it will go to retard the spark, and is moved toward the top of the wheel to advance the spark.



Steering Mechanism showing gears, tail lever, rear portion of steering connecting rod

Steering Gears. The power exerted at the rim of the steering wheel is transmitted through the inclined steering shaft to the worm gears located in the bronze housing at the base of the steering column. The worm gear is firmly secured to the lower extremity of the steering shaft, and meshes with the sector gear, which is a full circular gear, not a segment.

Steering Mechanism. A vertical shaft, called the steering tail lever, fits over the outer end of a shaft integral with the sector gear. The connection is by a hexagon taper. The lower end of the tail-lever is ball-shaped, forming a portion of the ball and socket joint at the rear end of the steering-connecting rod. There is a similar ball and socket joint at the other end of the connecting rod, both joints being very carefully made, packed in grease, and protected by leather boots strapped in place. Buffer springs at each end absorb the shocks caused by rough roads.

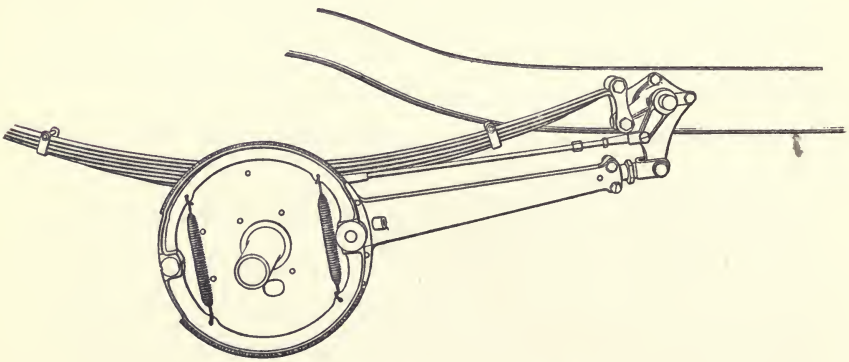
The right-hand steering knuckle terminates in a ball, forming part of the ball and socket joint at the front end of the steering-connecting rod. A cross-tie rod connects both steering knuckles. Thus it will be seen that as the steering wheel is turned, the horizontal sector shaft turns, causing the lower end of the tail lever to move backward or forward, the steering-connecting rod moving backward or forward with it. As a result, the front steering wheels, mounted on

pivots and tied together, turn to the right or left, depending on which way the wheel is turned.

Gear Shifting. The gear lever is located at the right of the car, operating in a simple two-slot quadrant. It is very easy to operate a selective type of transmission in any case; but the four speeds of the Locomobile are obtained by moving the lever in two slots only, which makes it very convenient.

Clutch. The clutch is operated in the conventional manner by a push-pedal operated with the left foot.

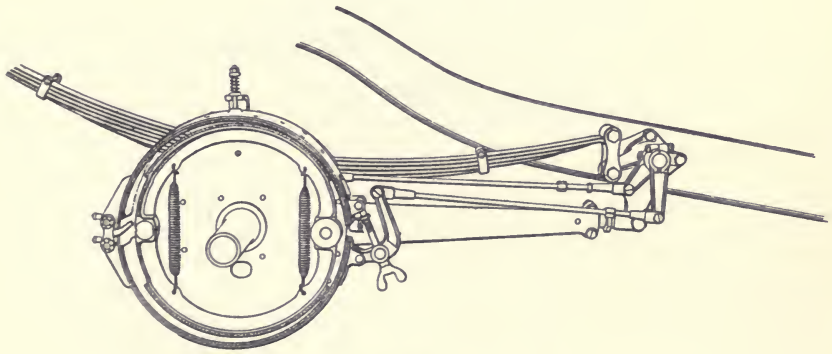
The Hand Brake. A latch lever at the right of the car when pulled backward expands the internal brakes against the inner circumferences of the brake drums bolted to the rear wheels. There is a brake shoe for each rear wheel, covered with asbestos and wire composition. Operation of the hand lever



Distance Rod and Internal Brake

on the "30" automatically disconnects the clutch before the brakes take hold.

The Foot Brake. This is the brake ordinarily used in stopping the car and is engaged by operating a push pedal with the right foot. The running brake consists of two shoes, one for each rear wheel, of the external contracting variety, operating on the outer circumference of a drum mounted on the rear wheels. The brakes are large in diameter, producing ample braking effort, and are wide, diminishing wear. The shoes are lined with an asbestos and wire composition. In case it is desired to adjust the brakes it can be done with little trouble, by simply turning a thumb screw on the front of the brake one-half turn, one turn or whatever may be needed.

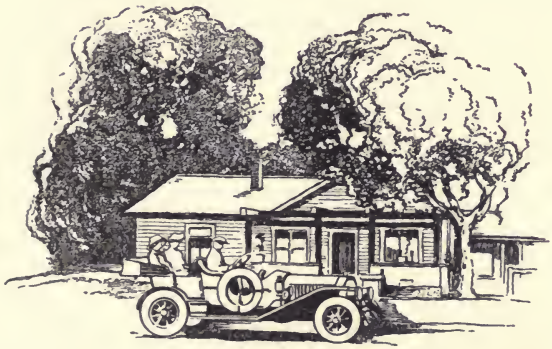


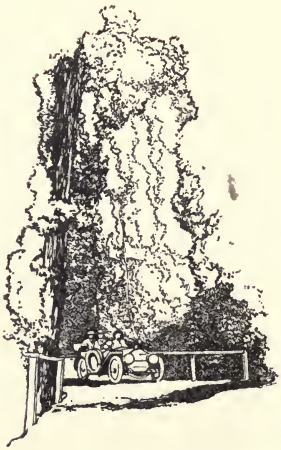
Same view as on preceding page only with foot brake added

Muffler Cut-Out. A round pedal in the front floor, operated with the left foot, enables the operator to open or close the muffler cut-out valve. This is convenient in testing the motor, or if, for any reason, it is desirable to hear the clear, sharp exhaust. The pedal or button may be locked in place with the cut-out valve open. Ordinarily it is not proper to operate the car with a free exhaust.

CHAPTER FIFTEEN

MISCELLANEOUS





CHAPTER FIFTEEN

MISCELLANEOUS INFORMATION FOR MOTORISTS

State Laws. The digest of State laws printed in this chapter contains the principal information needed from time to time by the tourist. Most States exempt non-residents either indefinitely or for a limited period of time. New Jersey is at this time a notable exception to this. In sections, where there are many cars in use, regulations are very strictly enforced and extra care must be taken. If in doubt, communicate with the proper State authorities for detailed information regarding the State law, and when entering any large city, if you are in doubt about the traffic regulations, an inquiry at first will save you trouble. For instance, in Boston the horn must be sounded before every street intersection or arrest is apt to follow.

The motorist should use what may be termed standard lamp equipment, consisting of two gas headlights, two oil side lights, and one rear lamp with white light illuminating license number, and red light showing to the rear. Numbers should be carried, front and rear, and should not swing. In a number of States the automobilist will get in trouble if his tail lamp goes

State	Registration	License	Numbers	Non-Residents
Alabama	Probate Judge of resident county.	No license required. Fee, $0.25.	No provision.	Not exempt.
Arizona	No State Law.			
Arkansas	No State Law.			
California	Secretary of State at Sacramento. $2, perpetual.	Chauffeur, $2. Owner may drive.	Rear, 3 inches high; Cal., 1 inch high; black on white ground.	Exempt — both owner and chauffeur.
Colorado	No State Law.			
Connecticut	Secretary of State at Hartford. Jan. 1 to June 1. 1 to 24 h.-p. $0.50 per h.-p.; 25 or more h.-p. $0.60 per h.-p. June 1 to Dec. 31, pro rata fees are charged. A.L.A.M. Formula h.-p. rating	All operators must carry license. $2, annual.	Numbers front and rear furnished by State. Numbers of one State only can be carried. Cannot swing.	Exempt 10 days if registered in home State and plates comply with regulations.
Delaware	Secretary of State at Dover. $5, annual.	All operators must carry license. $5, annual.	Front and rear, furnished by State.	Exempt, if O. K in home State.
District of Columbia	No registration fee required.	Driver, $2. Secure from Automobile Board, Washington.	Rear, 3 inches high; D. C., 1 inch high.	Exempt 10 days.
Florida	Secretary of State at Tallahassee. $2, perpetual.	Chauffeur, $2, perpetual. None required by owner.	Rear, 3 inches long, 2 inches wide; not supplied.	Exempt 30 days.
Georgia	No State Law.			
Idaho	No State Law.			
Illinois	Secretary of State at Springfield. $2, annual.	Chauffeur, $1, annual. Owner may drive.	Front and rear, 4 inches high; Ill., 1 inch high. Black on white. Seal must be carried.	Exempt, if carrying home State numbers.

State	Registration	License	Numbers	Non-Residents
Indiana . .	Secretary of State at Indianapolis. $1, perpetual.	None required for drivers.	Front and rear, 4 inches high; Ind. White on black. Not supplied.	Exempt, if carrying home State numbers and initials.
Iowa . . .	Secretary of State at Des Moines. $5, perpetual.	Covered by registration.	One rear, 3 inches high; Ia., 2 inches high. Not supplied.	Exempt.
Kansas . .	No State Law.			
Kentucky .	No State Law.			
Louisiana . .	No State Law.			
Maine . .	Secretary of State at Augusta. $2, perpetual	Chauffeur, $2, perpetual.	Front and rear, supplied by State.	Exempt, if home State numbers front and rear are carried.
Maryland .	Commissioner of Motor Vehicles, Baltimore. Fee, under 20 h.-p., $6; 20 to 40 h.-p., $12; over 40 h.-p., $18.	Operator's license required, $2.	Two front and rear, furnished by State. Other tags to be removed. Must not swing.	Exempt 7 consecutive days under special permit. Enquire Commissioner of Motor Vehicles.
Massachusetts	Mass. Highway Comm. Fee, less than 20 h.-p. (A.L.A.M. formula), $5; 20 to 30 h.-p., $10; 30 to 40 h.-p., $15; 40 to 50 h.-p., $20; 50 h.-p. and over, $25.	Driver's license required, $2.	Front and rear, furnished by State.	Exempt for any 10 days in the year, if carrying home State numbers. Summer residents may pay half the State fees for July, August and September.
Michigan . .	Secretary of State at Lansing. $3.	Chauffeur, $2, annual.	Two, front and rear.	Exempt.
Minnesota .	Secretary of State at St. Paul. Fee, $1.50, annual.	Chauffeur only, $2 annual; $1 for renewal.	Front and rear, furnished by State. Remove others.	Exempt.

State	Registration	License	Numbers	Non-Residents
Mississippi	No State Law.			
Missouri	Secretary of State at Jefferson City. $1.50, perpetual.	Chauffeurs, $2, perpetual.	Front and rear; front illuminated letters, 3 inches high; Mo., 2 inches high. White on black. Not supplied.	Exempt 20 days.
Montana	No State Law.			
Nebraska	Secretary of State at Lincoln. $1, annual.	None required.	Rear only; letters 3 inches high; Neb., 2 inches high. Not supplied.	Exempt.
Nevada	Secretary of State at Carson City.		One rear seal; must be displayed.	Exempt.
New Hampshire	Secretary of State at Concord. Fee, $10.	Chauffeur, $5. Owner, $1.	Two, furnished by State.	Exempt 10 days, conditionally.
New Jersey	Commissioner of Motor Vehicles. Fee, 10 h.-p., $3; 11 to 29 h.-p., $5; 30 h.-p. and over, $10.	Driver's license required, graduated according to h.-p., $2 and $4.	Front and rear, furnished by State.	Not exempt. Special license, good for 8 days, on payment of $1.
New York (New 1910 Law)	Annually with Secretary of State at Albany. 25 h.-p. (A.L.A.M. rating) or less, $5; 25 to 35 h.-p., $10; 35 to 50 h.-p., $15; over 50 h.-p. $25.	Chauffeur, $2. Examination required. Owner may drive	Rear, 3 inches high; N.Y. 1 inch high. Furnished by State. Illumination rear number important.	Exempt, if properly registered and home State reciprocates.
New Mexico	No State Law.			
North Carolina	Secretary of State at Raleigh. Fee, $5.		2 number plates, 3 inches high; N.C. 1 inch high.	Exempt.

State	Registration	License	Numbers	Non-Residents
North Dakota	No State provision			Exempt.
Ohio . . .	Secretary of State at Columbus. Fee, $5, annual.	Chauffeur, $2, Annual, Jan. 1.	Front and rear, furnished by State.	Exempt, when displaying home State numbers.
Oklahoma .	No State Law.			
Oregon . .	Secretary of State at Salem. $3, perpetual.	None required.	1 rear, 3 inches high. Light on dark preceded by Ore. 3 inches high.	Exempt.
Pennsylvania	State Highway Department, Harrisburg. Fee, $5 under 20 h.-p.; 20 to 50 h.-p. $10; over 50 h.-p. $15	Driver's license required. $2, annually.	2 plates furnished by State. Other tags to be removed.	Exempt, 10 days based on reciprocity.
Rhode Island	State Board of Public Roads, Auto Dept., at Providence. Fee, 5 to 20 h.-p. $5; 20 to 30 h.-p. $10; 30 to 40 h.-p. $15; 40 and over $25.	Driver's license required. Fee, $1.	Front and rear, furnished by State.	Exempt, 10 days if home State laws are complied with.
South Carolina . .	No State Law.			
South Dakota	Secretary of State at Pierre. Fee, $1.		Rear, 3 inches high, S.D. 2 inches high.	Exempt.
Tennessee	Secretary of State at Nashville. Fee, $2, $1 for filing.	Not required.	Front and rear, letters 3 inches high, 1 ½ inches wide.	Not exempt.
Texas . . .	County Clerk. Fee, $0.50.		One, 6 inches high, conspicuous.	Not exempt.
Utah . . .	Secretary of State at Salt Lake City. Fee, $2.		One rear plate, seal must be displayed.	Exempt.

State	Registration	License	Numbers	Non-Residents
Vermont . .	Secretary of State, Montpelier, $1 per h. p., first registration; 75c. second registration; 50c. third.	Driver's license. Fee, $2. All drivers.	Front and rear, furnished by State.	Exempt not exceeding 10 days. Special arrangement for 60 days or less.
Virginia . .	Secretary of Commonwealth, Richmond. Fee, $2.	No driving license required.	One, rear, supplied by State.	Not exempt.
Washington .	Secretary of State, Olympia. Fee, $2 annually.		Rear, 4 inches high; Wash. same size.	Exempt.
W. Virginia .	Secretary of State at Charleston.	Not required.	Two numbers, plates supplied by State.	Not expressly exempt.
Wisconsin .	Secretary of State at Madison. Fee, $2, perpetual.		Rear, 3 inches high with Wis. supplied by State.	Exempt if complying with home State law.
Wyoming . .	No State Law.			
Ontario, Can.	Provincial Secretary at Toronto. Fee, $4; $2 renewal, annual.	Chauffeur's license required. Fee, $1.	Front and rear, furnished. Remove other tags.	Not exempt.
Quebec, Can. .	Comptroller of Provincial Revenue, Quebec. Fee, $5.	Owner's and chauffeur's license. $5, annual. April 1.	4 inches high, 1 inch wide, front and rear. Que. underneath.	Non-resident Canadians only exempt.
New Brunswick, Can. . . .	Secretary Public Works, Fredericton. Fee, $2.	Chauffeur's, $2. Owner may drive.	Rear, figures 3 inches high. N. B. one inch high, black on white, not supplied.	Exempt.
Nova Scotia, Can. . . .	Provincial Secretary at Halifax. Fee, $5.	Chauffeur's, $2. Owner may drive.	Rear, figures 3 inches high. N.S. 1 inch high, black on white.	Exempt if complying with home Province or State.

out at night, so extra care must be given to this when touring. Sound the horn when passing under bridges, culverts, or at dangerous points.

Horse-power. The best known and most used formula for estimating the horse-power of an automobile motor is that known as the A. L. A. M. formula because of its adoption by the Association of Licensed Automobile Manufacturers. This formula is now used as a standard in a number of State laws. This formula is as follows: H.-P.$=\frac{D^2 N}{2.5}$. D is diameter of the cylinder, N is the number of cylinders, and 2.5 is a constant. According to this formula the four-cylinder motor of the Type "L" "30" Locomobile develops 32⅛ H.-P., and the six-cylinder motor of the Type "M" "48" Locomobile develops 48⅛ H.-P.

Automobile Organizations. The largest organization in this country is the American Automobile Association, composed of thirty-six State associations and several hundred clubs. New members pay $5.00 a year dues, but are not required to pay any entrance fee. Membership is of value in connection with American and foreign touring, and other matters, details of which may be obtained from the secretary, Robert Bruce, 437 Fifth Avenue, New York.

The Automobile Club of America maintains a Bureau of Tours, which offers information and assistance to tourists who are either members of the club or

members of the Bureau of Tours. The subscription fee, securing membership in the Bureau of Tours, amounts to $10.00 a year. Inquiries and applications should be addressed to the Secretary of the Bureau of Tours, Automobile Club of America, 54th Street, west of Broadway, New York.

The Touring Club of America, Broadway and 76th Street, opposite the New York Branch of the Locomobile Company of America, makes a specialty of supplying touring information to members.

Route Books for American Touring. The "Blue Book" is a standard publication issued for the convenience of automobile tourists, and is the official tour book of the American Automobile Association. Published by the Class Journal Company, 231 West 39th Street, New York. It is issued in four parts as follows:

Vol. 1. New York State and Lower Canada.
Vol. 2. New England.
Vol. 3. New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia and South-Eastern States.
Vol. 4. Middle Western States. Ohio, Indiana, Illinois, Michigan, Wisconsin, Kentucky, Minnesota, Iowa, Nebraska, Kansas and Missouri.

These books are illustrated with maps. Price is $2.50 a volume; special rates to members of the A. A. A.

The tour book of the Automobile Club of America is a good publication, containing American touring routes, and miscellaneous information on foreign touring, etc. This book is free to the members of the Bureau of Tours; the price is $3.00 to the general public.

American Automobile Maps. "Pilot" maps of the New England and Hudson River districts contain 103 sectional plates, and are published by the Automobile Blue Book Publishing Co., New York and Chicago. Large maps published by the A. C. A. are on sale at the Bureau of Tours, New York. C. S. Mendenhall, 512 Race St., Cincinnati, Ohio, publishes twenty State automobile maps, and issues a printed folder describing same, which will be sent on request.

Road maps of a number of the far Western States such as Colorado, Wyoming, Utah, Nevada, Idaho, Arizona, New Mexico and Montana, are published by Clason. Consult your bookseller. Other maps are Servoss's sectional maps; Blanchard's Pilot maps of New England; Walker's Adirondack and Canadian districts, etc. Brentano, New York, publishes a catalogue referring to automobile maps.

The topographical maps of the United States Geological Survey are exceedingly interesting to those who are familiar with contour maps. They are useful in exploring a limited area, because they give so much accurate and detailed information. Address the

Director, U. S. Geological Survey, Washington, D. C., and he will furnish advertising matter regarding them.

Foreign Route Books and Maps. Publications for the benefit of foreign touring are many in number. Brentano, Fifth Avenue, New York, publishes a catalogue of such publications, and this may be consulted to advantage. Bartholomew's Strip Maps of England are well regarded by those who have used them, and in Paris the Routes Taride are excellent. They are also published for Italy and Switzerland. The Carte Routiere Dion-Bouton is a very good general road map of France. Mittelbach's road maps of Germany and Austria are similarly well known.

Good hand books are published by the Michelin and Continental tire companies, and are easily obtainable. The automobile clubs of France, Italy and Switzerland publish excellent guide books, and membership in these clubs will enable the tourist to secure copies of these books. "Le Guide Taride" is a guide book that is regarded as excellent for touring in France.

Foreign Touring. The following suggestions will be found useful:

1. The tour should be planned in advance. This will be facilitated by reading up on the subject. There are a number of entertaining books about foreign automobile travel, among which are "Motoring Abroad", by Presbrey; "English Highways and Byways

from a Motor Car", by Murphy; "The Automobilist Abroad", by Miltoun; "High Roads of the Alps", by C. L. Freeston, and others. Consult your bookseller.

2. Shipment of the car may be placed in the hands of some reliable customs house broker in New York, or wherever the point of departure may be. He can take care of many details, including the crate, which should be of the "knocked down" variety, and ordinarily costs from $40.00 to $65.00; also pay the ocean freight and other charges, all for a lump sum. The rates for ocean freight are cheap from Boston and Philadelphia. All charges, including freight (ocean), boxing, dock charges, and customs charges, from New York to Liverpool, amount to about $108.00.

3. The owner's car must be registered at the Custom House in New York, or other point of departure, to obtain outward bound clearance, and before returning to America the owner must obtain from the American Consul at the point of departure, an inward bound clearance, and a declaration must be made before the consul that the car was exported from America. If the car is shipped through a customs broker, as in No. 2, this trouble is obviated as the broker will handle the matter.

4. The American Express Company are authorized forwarding agents of the American Automobile Association, and have issued a pamphlet entitled, "Auto Tips

for Auto Trips", which will be mailed on application to the foreign department of the company at 65 Broadway, New York.

5. Oelrichs & Company, Bowling Green Building, New York, are general agents for the North German Lloyd Company, and issue a pamphlet called, "How to Ship an Automobile Abroad". This may be consulted to advantage.

6. Before starting, obtain a letter from the manufacturer of the car, giving the name of the maker, model (year), style of car, number of car, color of body and chassis, make of tires, number of seats (places), weight, value, number of motor, number of cylinders, motive power, horse-power, together with the owner's name and address.

7. Membership in the Touring Club of France, at a cost of six francs, is desirable, and this can be secured by presenting certificate of membership in the A. C. A., or a letter from the A. A. A. certifying membership therein. The Touring Club of France arranges for a deposit to cover customs, duties, etc., by a "Triptyque". Deposit is returned at the end of the tour. Thus all duties are paid in advance, eliminating delays and trouble.

8. The Association Generale of France also offers service to the tourist. Membership is ten francs a year. Application blanks may be secured from the

A. C. A. or the A. A. A. This Association can furnish chauffeurs and has the power to issue licenses. The matter of license is very important in France.

9. The A. A. A. maintains reciprocal arrangements with the Automobile Association of London, and the Motor Union of Great Britain and Ireland, whereby these bodies extend certain courtesies and supply certain information upon presentation of A.A.A. membership cards. Members of the A. C. A. are able to secure cards of introduction to the Royal Automobile Club in order to secure information in planning trips in Europe.

Insurance. Automobile owners carry insurance in some of the various forms given below, especially the "floater" form of fire insurance, which includes burglary, theft, and hazards of transportation. Liability insurance for injuries to persons and damage to property is also desirable. While some desire insurance covering damage to the *car*, it is not carried by the majority of motorists today, owing to its high rate of premium, the cost being higher than that for personal injuries.

1. Fire, burglary and theft, and hazards or transportation.

This policy is issued in floating form, covering the car wherever it may be within the boundaries of the United States or Canada, or on board a United States or Canadian coastwise

steamer, against loss or damage to the automobile by fire, arising from any cause whatsoever, explosion, self-ignition, and all hazards of transportation by railroads, steamboats, and coastwise steamers, at the lowest prevailing rates. The cost of this class of insurance is 2 per cent where the car is kept in a private garage seven months in the year. Where the car is kept in a public garage, the cost is 2½ per cent. (Policies can be extended for a small additional premium to cover European touring.)

2. Injuries to persons. (Liability.)

This class of insurance protects the owner against his legal liability for injuries caused by his car to person or persons. The limits of this policy are $5000 for injuries to one person, and $10,000 for injuries on any one accident, no matter how many persons may be involved. The Insurance Company defends all suits and pays all the law costs incurred by the owner in addition to the full limits of the policy. It gives protection for claims and suits which are many times brought against an owner for exorbitant sums, and which are always annoying and costly. The rates for this class of insurance vary with the horse-power of the car, and also as to whether the car is used in or around large cities or in small cities and in the country.

3. Damages to car.

This insurance covers damages done to the car by collision with another car, or with any other object. It covers all damages up to the full insurance value of the car (including tires, if damage amounts to $200). It includes damage done to lamps.

4. Damage to property of others.

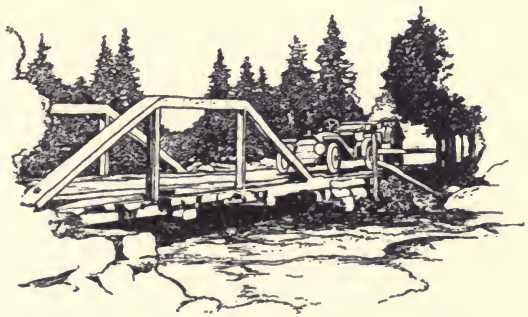
This provides insurance for damage to property of others by collision, for which the assured is liable. This applies to any other automobile or wagon, or fence, bridge or other object. This insurance will cost 25 per cent of the rate charged you for personal injuries. For this small premium it is well worth while to have this insurance.

5. Owner's insurance.

This class of insurance insures the owner against personal injuries sustained while operating, being driven in, or caring for the insured motor car.

6. Chauffeur's insurance.

This insures the paid driver against personal injuries sustained while operating, being driven in, or caring for the insured motor car.



WHAT IS THE LIFE OF A CAR?

BY HERBERT L. TOWLE

Many a car, by dint of constant tinkering, continues to run after it is "all worn out". When an automobile reaches this stage of its existence, it may be said to have no value. Long ago it has probably changed hands several times. For the individual owner, therefore, the practical question is, "How far will this car run before I want to get rid of it, and what will its selling value be then"?

Until very recently it was the custom to consider the automobile purely a means of recreation. If it was ready to run, well and good. If not, an afternoon would be spent fixing it up, and no particular harm was done. Latterly, however, a new class of owners has arisen, comprising physicians, business men, commuters, and others, who depend on their automobiles for necessary daily transportation. To these owners their automobiles are useful only so long as they can be kept in daily service. Two or three weeks may be allowed during the winter for overhauling, but it is essential that the automobile shall not give out in unexpected ways. If it simply wears out, the various parts can be watched and replaced or refitted. When, however, things begin to break or come loose, the car must be passed on to a less exacting owner, though with care its subsequent mileage may be considerable.

To be specific, let us assume that a car is used to go a couple of miles to and from the station or place of business in practically all weathers. During the day, the owner's wife uses it in various ways, such as for paying calls, marketing, and taking out her friends; also it is run, as a rule, on a pleasure excursion of from fifty to one hundred and fifty miles each week-end. It is housed in a private garage, and is kept clean and in order by the handy man under the owner's directions.

The car for this service will probably have from twenty to thirty horse-power. In twelve months it is likely to run about ten thousand miles. How many seasons such as this will it bear before it ceases to be thoroughly dependable?

The answer will depend almost wholly on the quality of materials and workmanship in the car. A high-grade, high-priced car may easily run fifty

thousand to seventy-five thousand miles without developing weakness in any part. It will wear out, it is true, but it will wear out by degrees, and a yearly overhauling will make everything sound for the next twelve months, barring minor adjustments, and the like.

It may, indeed, be said of the high-grade car that its useful life is not limited by the durability of the major wearing parts—cylinders, pistons, gears, bushings, etc.—since all of these, even the cylinders, can be replaced without prohibitive expense. The end of its usefulness to the average owner is reached rather when the thousand and one minor wearing parts become so loose and so noisy that, although the car still runs, there is no longer pleasure in driving it. In modern cars more or less is done to defer the inevitable day when minor parts wear out, but when they do it is frequently impracticable to do anything except buy new ones throughout, which would cost more than the remaining value of the car. It is true that in many cases ingenuity will avail to minimize the expense, and it is also true that the tendency is steadily toward making it easier to refit or replace the small as well as the large wearing parts, and to defer the day of their wearing out, by providing lubrication. Nevertheless, it may be said broadly that the car has reached the end of its usefulness when its noise is no longer bearable.

How is it with the cheaper cars?

For one thing, the cheaper car does not last as long. Where a thirty-horse-power car, costing from $2500 to $3000, will run 50,000 miles before ceasing to satisfy the exacting owner, the $1200 car of like horse-power is exhausted when it has covered 15,000 or 20,000 miles. As for the cars rated at twenty horse-power and thereabouts, and sold at $900 to $1000, 10,000 miles seems to be about their limit of mileage in the hand of the first owner.

The fact is that it is impossible to build as good a car for the lower as for the higher price. The gears, shafts, axles, and frames must be of cheaper steel, more hastily finished and put together. The bearings are necessarily quite different from the costly, but almost indestructible, ball and roller bearings of the expensive cars. The fitting is more hastily done, and detail refinements of both design and construction are everywhere slighted in order to get the factory cost within the permissible limit. The result is not simply that wear is more rapid, but that it can less confidently be predicted. The high-grade car is not exactly like the "One-Hoss Shay"; yet, at all events, it doesn't break down, but simply wears out. The design of the cheap car is not so well balanced;

something or other is sure to break or loosen before its time, and little unpleasant surprises, such as the loosening of the steering-gear, the shearing of a key, or the stripping of a badly hardened gear, are to be expected after the first year of service. These things may not necessarily condemn the car for subsequent pleasure use, but they do unfit it for the exacting requirements of business use.

As for the value of a car when sold at the end of its ten thousand or fifty thousand miles, that is a subject on which it is hard to generalize. Probably as many used cars are sold at too high as at too low figures. A low-grade car can generally be sold for about half its first price at the end of its first season, though whether it is worth as much may sometimes be questioned. The high-grade car at the corresponding period of its life will admittedly command a lower sum; that is to say, one cannot sell it after fifty thousand miles at half its first price. A quarter is more nearly correct, but that is due partly to the simple lapse of time and partly to the likelihood that similar cars can be bought for less money than the used car cost when new, owing to lessened cost of production. Even at that, however, the writer regards the high-grade car, bought with a view to running it, say fifty thousand miles before selling, as the more economical purchase of the two.

NATIONAL ASSOCIATION OF AUTOMOBILE MANUFACTURERS, Inc.

STANDARD WARRANTY

ADOPTED MAY 14th, 1910

We warrant the motor vehicles manufactured by us for ninety days after the date of shipment, this warranty being limited to the furnishing at our factory of such parts of the motor vehicle as shall, under normal use and service, appear to us to have been defective in material or workmanship.

This warranty is limited to the shipment to the purchaser, without charge, except for transportation, of the part or parts intended to replace the part or parts claimed to have been defective, and which, upon their return to us at our factory for inspection, we shall have determined were defective, and provided the transportation charges for the parts so returned have been prepaid.

We make no warranty whatever in respect to tires or rims.

The condition of this warranty is such that if the motor vehicle to which it applies is altered, or repaired outside of our factory, our liability under this warranty shall cease.

The purchaser understands and agrees that no warranty of the motor vehicle is made, or authorized to be made, by the company, other than that hereinabove set forth.

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